pH, Orion @ FV

pH, Orion2-Star

pH, Orion A211

pH, Orion A111

pH, Beckman @ BRDG

pH, VWR Symphony @ BRDG

Metrology; Measurement Balances, pH, Temperature, Time

Description and SOPs

Hydrometer

Wall Clocks

IR Temp probe
Laser site

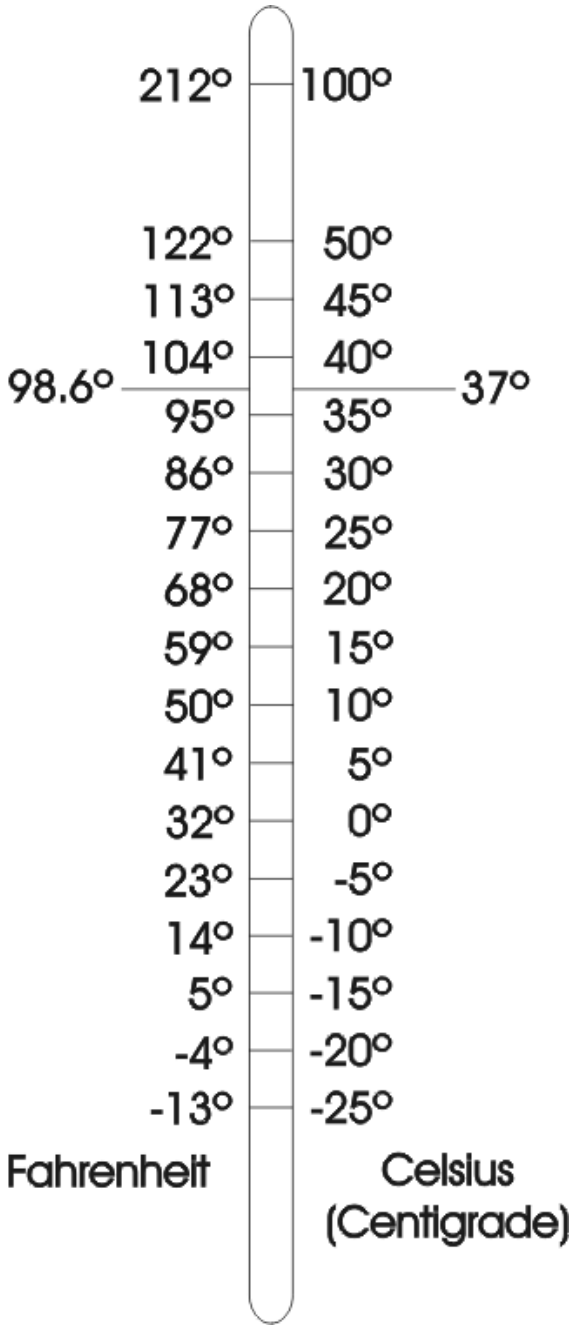
Gas Detectors, alarms

Balances, Prep/Lab

pH, wand

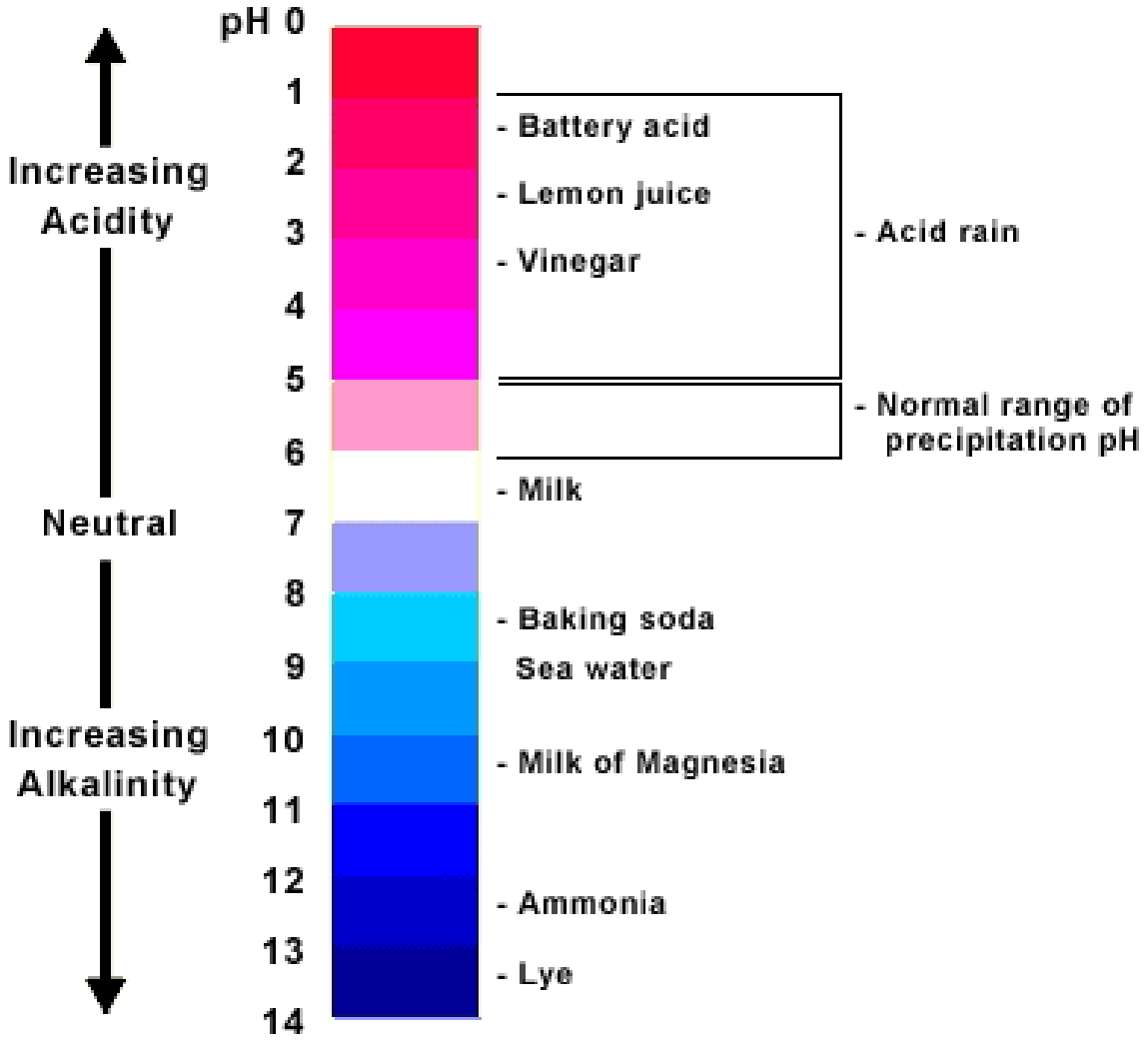
Prepared by: Bob Morrison
STLCC, Instrumentation Specialist
Oct 2008, Latest Revision Nov 2012

Refrigeration: Temp Conversion Chart



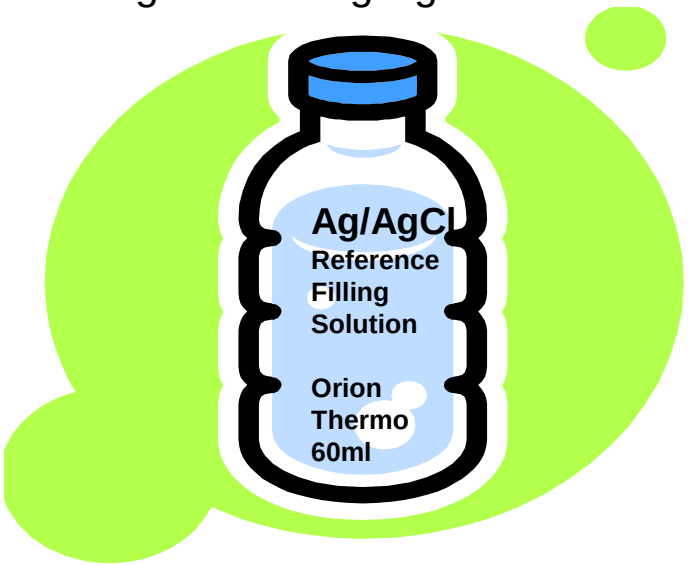
37 C = 98.6 F human body
22 C ~ office temp
4C = 39F home refrigerator
-20C = - 4F home freezer
-80C = - 112F DNA temp
-132C = - 207F Cryto storage

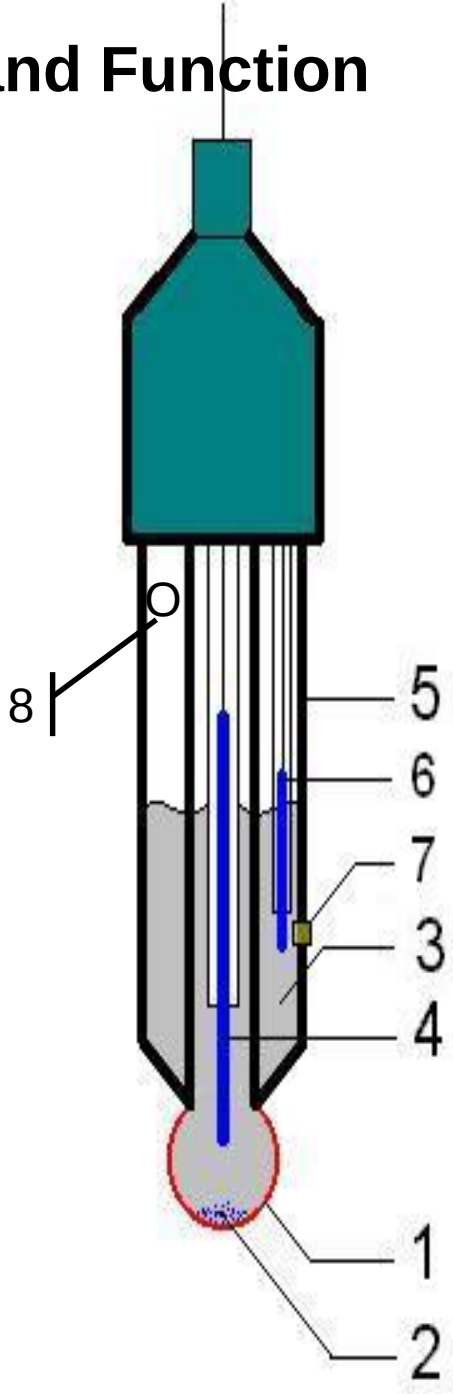
Metrology: pH Meter: pH Range of Common Items



Metrology: pH Meter: Electrode Parts and Function

1. a sensing part of electrode, a bulb made from a specific glass
2. sometimes the electrode contains a small amount of AgCl precipitate inside the glass electrode
3. internal solution, usually Ag/AgCl
4. internal electrode, usually silver chloride electrode or calomel electrode
5. body of electrode, made from non-conductive glass or plastics.
6. reference electrode, usually the same type as 4
7. junction with studied solution, usually made from ceramics or capillary with asbestos or quartz fiber
8. Filling hole for Ag/AgCL solution.





Metrology: pH Meter : General Guidelines: Electrode Preparation and Storage

1. Remove the protective black plastic storage cup if one is present on the end of the probe. Save for future long term storage.
2. Clean any salt deposits from the exterior by rinsing with DI water.
3. Uncover the fill hole (remove blue stopper) near the top of the electrode, drain any liquid still inside the tube.
4. Fill the inner electrode tube with fresh Ag/AgCl solution to a level 1" above the anticipated immersion level in the sample but below the fill hole line using Orion Thermo 900011 reference electrode filling solution, Clear plastic 60ml bottle.
5. DO NOT plug the fill hole during pH testing, it must remain open.
6. Clamp or fix the electrode with filling solution in an upright position for 15 minutes prior to use to thoroughly wet the reference junction. Once wet, do not allow the junction to become dry.
7. Shake the electrode slightly before use (as you would a clinical thermometer) to remove any air bubbles. Dry the electrode exterior with a lab tissue wipe.

Storage:

- For short term storage (days), leave electrodes to soak in a storage solution of 200ml pH 7 buffer with 1g KCl added.
- For long term storage (weeks), drain inner fill cavity, rinse with DI water, clear any salt deposits, return tip storage cup, and store in totally dry environment.

Metrology: pH, VWR Symphony, Links to Manuals/Guides
Model Type: SB70P, Epoxy ATC Probe, Cat-14002-780

"ON" Press and hold for 2 sec to turn unit on/off

Note: Manuals and Guides were scanned from original paper documents. native/original versions in pdf were not available from VWR or other sources.

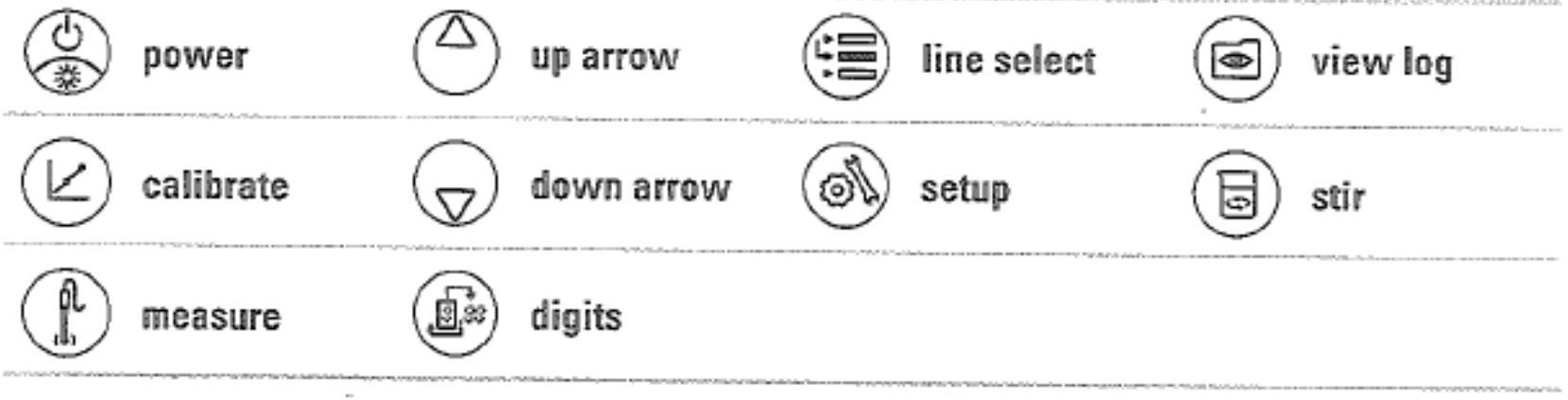
Some pages require rotation for viewing

Hotlink to VWR Symphony Quick Start Guide …..(pdf)

Hotlink to VWR Symphony User Guide …..(pdf)

Hotlink to VWR Symphony Calibration Cert, Probe Manual…..(pdf)

Metrology: pH Meter, VWR Symphony, Buttons and Overview



1. To power on the meter press the **power** key.

2. Press the **line select** key to choose the top, middle, or bottom display line. The ▶ icon will point to the selected line.

3. In the measurement screen press the **up arrow** key to change the value on the top display line to pH, RmV, mV, or a blank line.

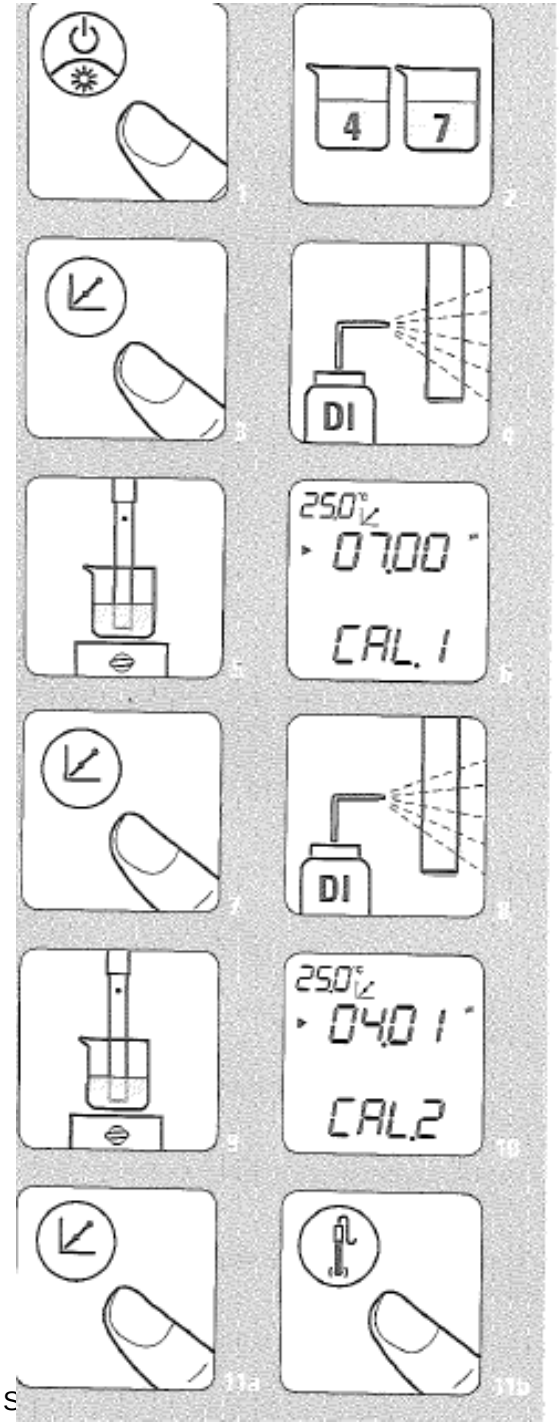
4. To escape out of any meter function, press and hold the **measure** key until the meter returns to the measurement mode.

5. The sympHony™ pH meters can be calibrated using up to five pH buffers.

Metrology: pH,VWR Symphony, 3 Point Calibration (May 2012)

Three points calibration procedure for **pH Meter SYMPHONY SB70P**

1) Turn on instrument.
2) Ensure that the hole on the upper side of the electrode is opened (a white rubber band covers it when not in used).
3) Rinse electrode gently with ddH2O. Remove excess of water by blotting on tissue wiper.
4) Submerge electrode in a fresh calibration standard pH 4.0.
5) Press "calibration" on instrument. Display will show "CAL 1".
6) The "pH sign" will blink (right side of display) until it reaches pH 4.01. Once the "pH sign" stops blinking, the electrode has been calibrated for standarc pH 4.0.
7) Press calibration. Display will show now "CAL 2".
8) Repeat steps 3 through 7 for standards 7.0 and 10.0.
    a. Standard 7.0 will display "CAL 2"
    b. Standard 10.0 will display "CAL 3"
9) After the last standard (CAL 3) has been calibrated (pH 10.01), press "measure". Display will show the slope. If the slope is below 90%, repeat calibration. If problem persist notify lab manager.



pH Autocalibration with Two Buffers

1. Press the **power** key to turn on the meter. **See 1.**
2. Select two buffers that bracket the expected sample pH and are one to four pH units apart. **See 2.** See **Autocalibration Buffer Selection** section.
3. Press the **calibrate** key. **See 3.**
4. Rinse the electrode with deionized water and blot dry with a lint-free tissue. **See 4.**

   NOTE: *Do not wipe or rub the electrode, as static buildup will occur.*
5. Insert the electrode into the first buffer and gently stir – if a stir probe is being used press the **stir** key to start and stop stirring (benchtop models only). **See 5.**
6. Wait for the **pH** icon to stop flashing and the ▶ icon to start flashing. The meter should display the temperature corrected pH buffer value. **See 6.**

   If the displayed buffer value is incorrect or a customer buffer is being used manually enter the value by pressing the **up/down arrow** keys to adjust each digit and the **digits** key to move to the next digit.
7. Press the **calibrate** key. **See 7.**
8. Rinse the electrode with deionized water and blot dry with a lint-free tissue. **See 8.**

   NOTE: *Do not wipe or rub the electrode, as static buildup will occur.*
9. Insert the electrode into the second buffer and gently stir – if a stir probe is being used press the **stir** key to start and stop stirring (benchtop models only). **See 9.**
10. Wait for the **pH** icon to stop flashing and the ▶ icon to start flashing. The meter should display the temperature corrected pH buffer value. **See 10.**
11. Press the **calibrate** key and then press the **measure** key to save and end the calibration. The slope will be displayed and then the meter will proceed to the measurement mode. **See 11a & 11b.**

Metrology: pH Meter, VWR Symphony Auto-Calibration with 2 Buffers

Metrology: pH Meter, VWR Symphony, Measurement Mode Selection

1. Press the **setup** key.

2. Press the **up arrow** key until rEAd is displayed on the top line.

3. Press the **line select** key to move the ▶ icon to the middle line. Press the **up arrow** key until tYPE is displayed.

4. Press the **line select** key to move the ▶ icon to the bottom line. Press the **up arrow** key to select the measurement mode. AUtO is default setting.

   COnt = Continuous measurement mode
   AUtO = AUTO-READ™ measurement mode
   tImE = Timed measurement mode

5. Press the **line select** key to move the ▶ icon to the top line. Press the **measure** key to return to the measurement mode.

Metrology: pH Meter, VWR Symphony, Measurements

1. Rinse the electrode with deionized water, blot dry with a lint-free tissue, and insert the electrode into the sample.

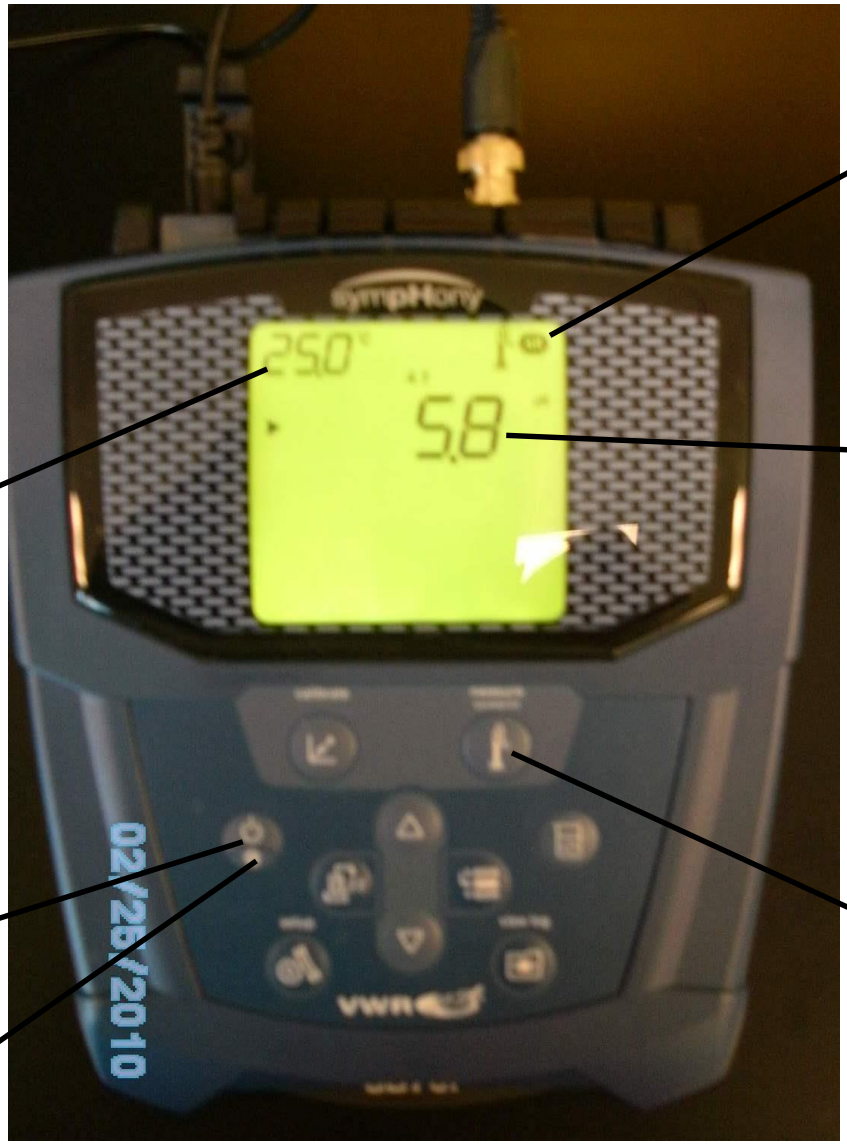
2. If the meter is in AUTO-READ mode, press the **measure** key to take a measurement. Once the reading stabilizes the **AR** icon will stop flashing and the display will freeze. Press the **measure** key again to take a new measurement.

   If a stir probe is connected it will start stirring when the **measure** key is pressed and stop stirring when the **AR** icon stops flashing (benchtop meters only).

3. If the meter is in the continuous or timed measurement modes, the meter will continuously take measurements and update the display. Once the reading stabilizes the **pH** icon will stop flashing.

   If a stir probe is connected press the **stir** key to start stirring and press the **stir** key again to stop stirring (benchtop meters only).

Metrology: pH Meter: VWR Symphony, @BRDG, Automatic Read Mode, Model Type: SB70P, Epoxy ATC Probe, Cat-14002-780



3. System should start in Automatic Read Mode with "AR" blinking

4. Remove probe and insert in your sample

5. Wait until the AR and small pH display stop blinking. This is the Measured pH.

6. Rinse probe with DI water and return to stand

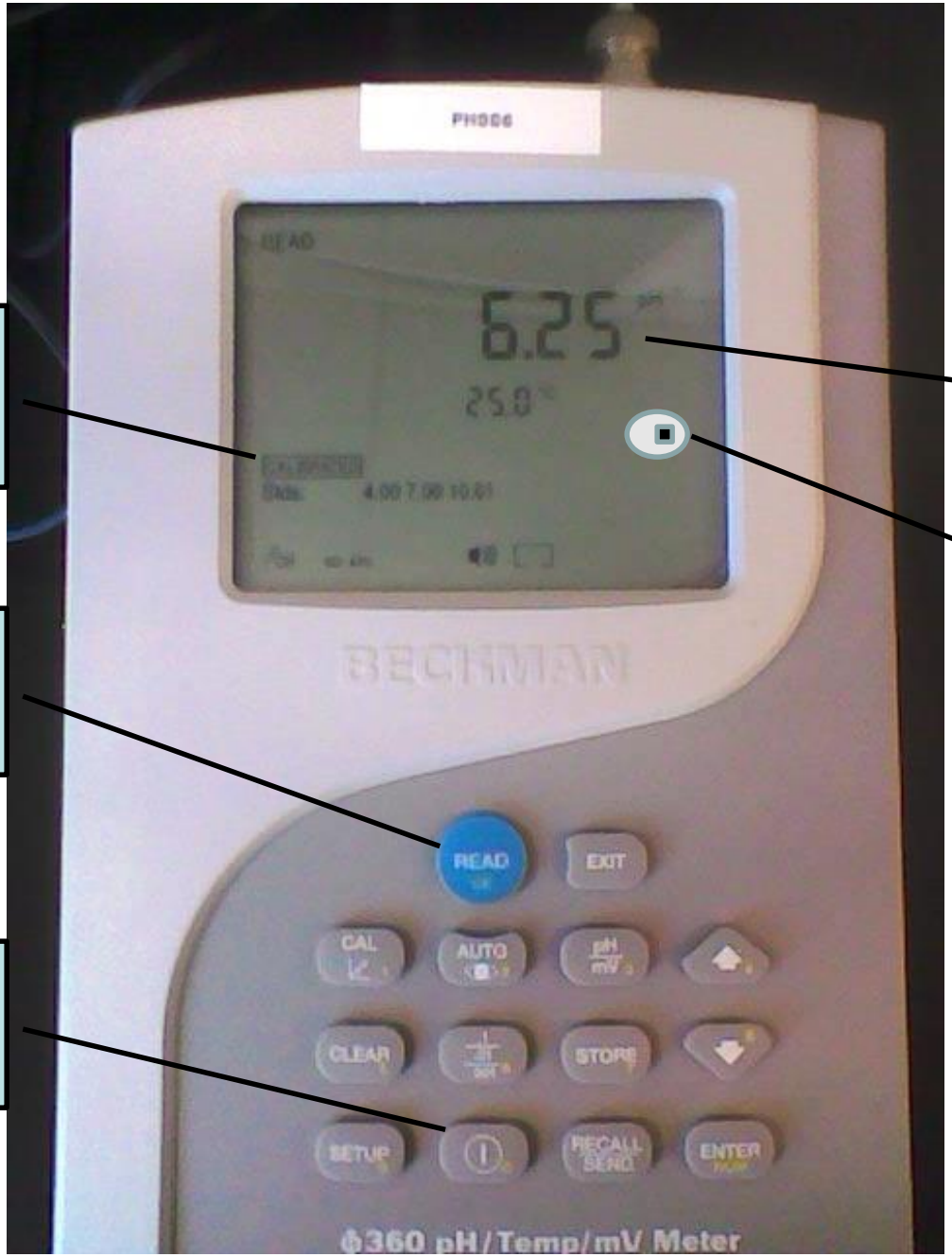
Current Temperature of sample

1. Press and hold for 2 sec to turn unit on/off

2. Press bottom of key to turn on or off lighted display

Press once if needed to go to Automatic Read Mode

Metrology: pH Meter: Beckman 360, @BRDG, Sealed Electrode



2. [CALIBRATED] displayed and standards are shown

3. Press "READ" to begin Auto-Read function for pH

1. Press and hold to turn unit on/off, observe startup screen

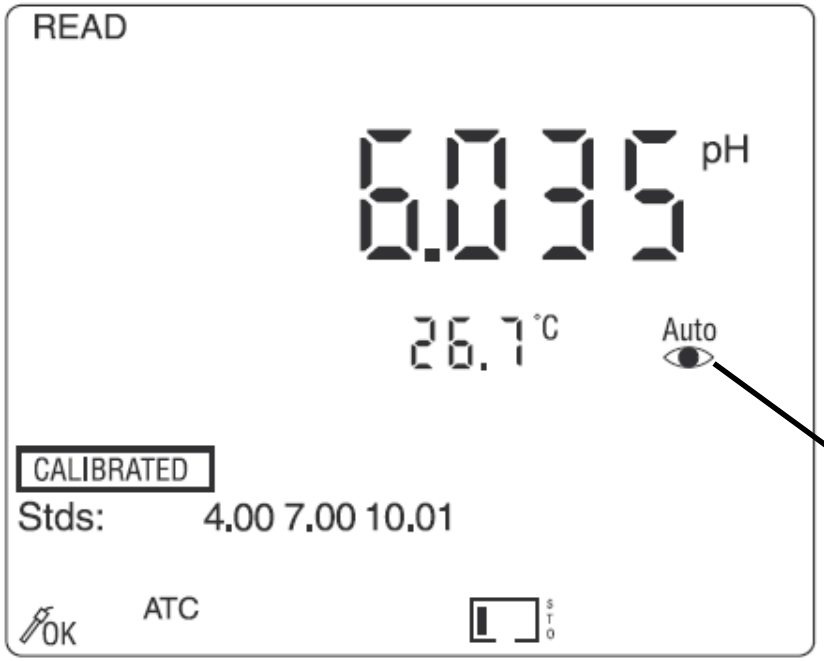
5. Displayed pH value during Auto-Read

4. Auto-Read indicator blinks until it reaches best value

Link to Beckman360 User Manual..pdf

Metrology: pH Meter: Beckman 360@BRDG, Auto-Read Function

especially if they differ significantly from the neutral pH 7.00.



900611.eps

Figure 15 pH Measurement (Standard Buffers)

The display shows a pH reading based on a three-point calibration. The feature View Standards is turned on. Because an ATC probe is connected, the pH 6.035 value reflects a temperature-compensated result.

Auto-Read indicator, blinks until it reaches best value

Immerse the probe into the sample and press the **READ** key. During the measurement, calculated pH values are displayed continuously and the Auto-Eye flashes, if Auto-Read has been turned on. Wait until the result has stabilized or the Auto-Eye stops flashing. This may take 30-60 seconds or longer, depending on the sample.

Metrology: pH Meter: Orion 410A@ FV (Student Lab Use)

Current Mode Displayed

Mode Button: Cycle from Setup, Calibrate, Measure

Yes and NO buttons for command prompt responses

Power On/Off button

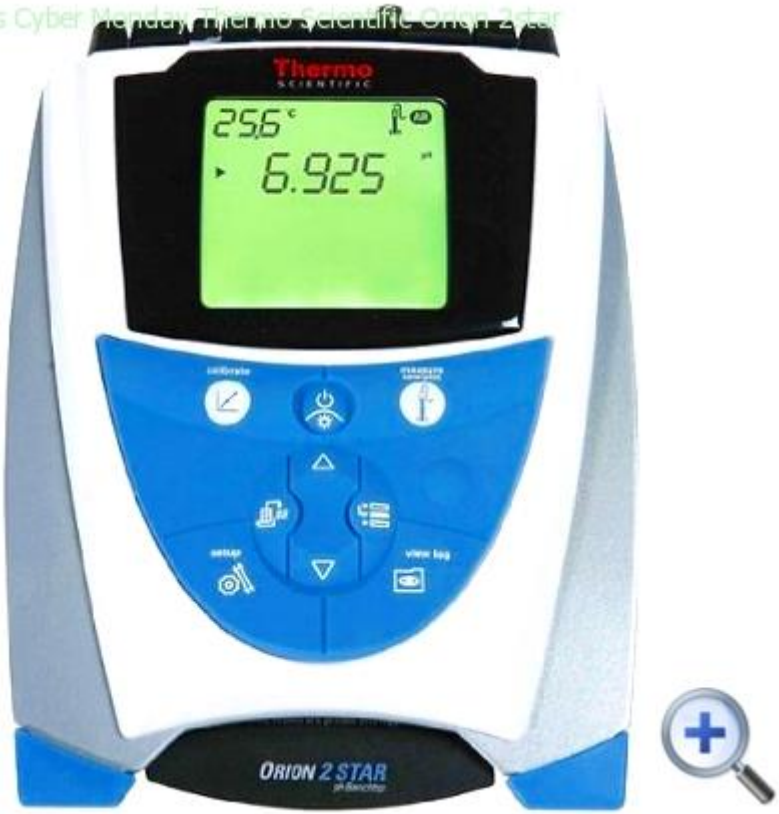
- 3 point auto calibration with choice of 3 buffers
- ROSS Resolution to 0.001 pH units
- Simultaneous pH and Temperature display
- Durable, easy-to-use design
- Housed in a splash- and chemical- resistant case
- Easy three keyÃ¢â‚¬â€YES, NO, and MODE operation
- Auto calibration
- Automatic temperature compensation
- Choice of pH resolution
- Equipped with RS232 interface that allows transfer of data using the optional Thermo Orion Model 900A printer or computer
- Accuracy +/- 0.005
- pH Range -2.00 to 14.00
- Resolution 0.001
- Calibration Points 3

Metrology: pH Meter : 410A Calibration with Three Buffers

1. Connect the electrode and AC/DC adapter to the meter and press the Power button. Note, generally the meter, adapter, and electrodes should be prepared ahead of time.
2. Arrange the 4.00, 7.00, and 10.00 buffers for calibration in 3 small flask or large tubes in holders
3. **Make sure the blue plug hole cap is removed (hole open) during the pH testing**.
4. Press the MODE button until “CALIBRATE” is displayed. Then press the NO button twice until “3P7” is displayed. This is the desired calibration sequence.
5. Make sure all standard solutions buffers are fully stirred and calm before calibration begins.
6. Place the prepared electrode (see Electrode Preparation protocol) into the 4.00 calibration buffer.
7. Press the “YES” button and wait until a steady P1 value is displayed and “Ready” is shown next to the reading. Press the “YES” button to move to the P2 calibration state.
8. Remove the pH probe, rinse with DI water, dry, and place in the 7.00 calibration buffer.
9. Wait a few seconds for a steady P2 value and “Ready” to be displayed, then press “YES” to move to the P3 calibration state.
10. Rinse the electrode with DI water, dry, and then place into the 10.00 buffer. Wait for a stable pH P3 reading and the “Ready” to be displayed.
11. The meter should automatically advance from the CALIBRATION to the MEASURE mode. If not, press MODE until MEASURE is displayed. The meter is now ready for sample testing.
12. Thoroughly rinse the electrode with DI water, dry, and begin sample testing.

Metrology: pH Meter; Orion 2-Star

(currently for Lab Personnel use in prep areas)



pH : Range : 0.000 to 14.999 Resolution : 0.001/0.01/0.1 Relative Accuracy : ±0.002 SMART STABILITY™ : Yes Calibration points : 1,2,3 SMART AVERAGING™ : Yes Slope : 80- 120% Auto Buffer Recognition : 4.01, 7.00, 10.01/ 1.68, 6.86, 9.18, 12.46 Selectable calibration sets : Yes, USA or EURO Custom Buffers Accepted : Yes Temperature : Range / Resolution : -5 to 105 C / 0.1 up to 99.9 C, 1.0 over 99.9 C Relative Accuracy : ±0.1 C Temperature Compensation : Auto/ Manual mV : Range - mV / RmV : ±1999.9 mV ORP : E autocalibration to standard hydrogen electrode Resolution : 0.1 mV Relative Accuracy : ±0.2mV or 0.05%, whichever is greater Relative mV : Range : ±1999.9mV Resolution : 0.1mV Relative Accuracy : ±0.2 mV or 0.05% of reading, whichever is greater Display : Custom LCD Inputs : BNC, ATC mini DIN locking, power Outputs : RS232 Power : Universal power adapter and battery power 4X AA batteries Regulatory and Safety : CE, CSA, UL, T0V, FCC Class A limits Environmental Requirements : 5 to 45 º and 85% relative humidity, non-condensingC Special GLP Software Features : # of data logging points : 50 points by time, stability or manual read with time and date stamp Advanced Self-test and Diagnostics : YES GLP Electrode Verification : YES IP Rating : IP54, splashproof and dustproof Warranty : 36 months (from date of purchase)

Hotlink to Thermo Electron Corp Orion 2-Start User Guide …..(pdf)

Metrology: pH Meter, Orion 2-Star, Navigation Tips

Navigation Tips

- Press △ / ▽ to scroll through main menu items on the top line. You will see corresponding grey text on the LCD.

- The ⚙ enters the setup mode.

- Use ☰ to select top, middle or bottom line.
- Use △ / ▽ in combination with ⚙ to edit the values in selected line.
- Use ☰ to accept changes and return the arrow icon to the top line.

- Use ✓ to save changes and return to the measurement mode.

Metrology: pH Meter, Orion 2-Star, Keys

- Turns meter on, if shut off.
- Toggles backlight on & off, if meter is on.
- If meter is on, holding down will turn off the meter.

- Changes measurement mode of the selected line.
- Changes selected line in Setup, Methods & Log View.
- Edits the value of the flashing digit for Setup, Password entry, and Calibration.

Switches arrow on left of the screen between 3 display lines to select and edit.

Changes selected digit to edit and moves decimal point when changing values in Setup, Password entry, & Calibration.

Starts calibration for currently selected line and measurement mode.

- If arrow is pointed to the top line and the current units are pH, will start a pH calibration.
- Each time is pressed in the calibration it will accept the current point value and move to the next cal pt until the max # of cal pts are performed, then it will return to measurement mode.

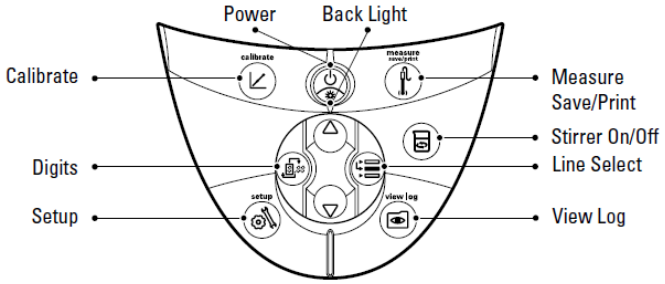
- Print & Log a measurement in continuous or timed measurement mode.
- Prints, Logs, & Freezes screen when the reading becomes stable.
- Exits SETUP and returns to measurement mode.
- Accepts Cal pt and returns to measurement mode.

Enters SETUP menu starting with selected line and measurement mode:

If arrow is pointed to top line and current units are ISE, then will enter the ISE setup screen.

Enters LOG View & Download Screens.

Turns stirrer on & off.



Metrology: pH Meter, Orion 2-Star, Read Modes and Settings

Description	Display	Range of Values	Default Value	Method Specific
Continuous, Timed, or Auto-Read Measurement Selection	rEAd tyPE COnt	**Cont, AUtO, timE** Timed, Continuous, or Auto-Read; Auto Prints and Datalogs in AUTO & Timed Modes	**Auto**	Yes
Timed Reading Setting	rEAd tImE 00:00	**00:05 - 99:61** Timed Readings in Minutes & Seconds	**01:00**	Yes

To change settings, simply use (menu) and (△) / (▽) to move between options. Pressing (menu) will confirm the change of a value and end the flashing display.

Orion Star Series meters allow you to select your preferred timing for measurement intervals.

- In continuous mode the instrument is constantly making measurements and updating the screen. To Print & Log the measurement in this mode press (print).
- In timed mode the instrument is constantly making measurements, updating the display, and will automatically log and print data at a pre-selected time interval.
  - In the setup menu enter the minutes & seconds between timed readings by pressing (△) / (▽) to change the value of the flashing digit. Press (→#) to change the digit to be scrolled.
  - The minimum time interval is 5 seconds. Acceptable time ranges are: 00:05 – 99:59
- In AUTO-READ mode the instrument starts a measurement whenever (print) is pressed. Once the reading becomes stable, the display freezes while data is automatically logged and printed.

Metrology: pH Meter, Orion A211

Orion
Benc

Hotlink to ThermoSci Orion A211,A221 Manual…..(pdf)

Metrology: pH Meter, Orion, Buttons

Press the *f1, f2* and *f3* function keys to perform the action shown above each key on the display.

Press to turn the meter on.

When the meter is on, press and quickly release to turn the display backlight on or off or hold down to turn the meter off.

In the measurement mode, press to take a measurement.

In the setup, calibration and other menus, press to escape the current menu and return to the measurement mode.

In the measurement mode, press to enter the setup menu.

In the setup, calibration and other menus, press to scroll up through a list of options.

In the continuous measurement mode, press to hold (freeze) the displayed measurement and press again to release (unfreeze) the measurement.

In the setup, calibration and other menus, press to scroll left through a list of options.

In the measurement mode, press to change the displayed measurement mode. Options are pH, mV, RmV (relative mV) and ORP.

In the setup, calibration and other menus, press to scroll right through a list of options.

In the measurement mode, press to log or print a measurement.

In the setup, calibration and other menus, press to scroll down through a list of options.

Press to view the data log and calibration log. *Orion Star A277 benchtop meters only.*

Press to start or stop the stirrer probe. *Orion Star A277 benchtop meters only.*

Metrology: pH Meter, OrionStar_A111, @BRDG

This Thermo Scientific Orion Star A111 pH Benchtop Meter makes it easy and affordable to take simple, accurate pH measurements. The large LCD display shows pH or mV readings along with temperature. Icons provide quick updates on battery life, electrode status and calibration information. Simple button layout and onscreen messages help with calibration and setup menu choices. The AUTO-READ locks in the stable reading on your screen and ready indicator alerts when readings are stable. Up to three point pH calibration. Automatic recognition of USA/NIST and DIN buffers. Easily recall calibration slope data for procedure checks. The non-volatile memory holds up to 50 data points. Included electrode arm and newly-designed probe holder make it easier to maintain and place probes into samples. Plug the meter into almost any power outlet with the included universal power adapter, or use four AA batteries (sold separately) to run the meter on DC power. The IP54-rated housing can handle splashes and can be wall-mounted if table space is a problem. Certifications: CE, TUV, FCC Class A limits. pH Range: -2.00 to 16.00. pH Resolution: 0.1, 0.01. pH Relative Accuracy: ±0.01. pH Calibration Points: up to 3. mV Range: mV-- ±1600.0 mV; RmV-- ±1999.9 mV. mV Resolution: 0.1. mV Relative Accuracy: ±0.2 mV or ±0.05% of reading whichever is greater. Temperature Range: -5 degree to 105 degree C. Temperature Resolution: 0.1. Temperature Relative Accuracy: ±0.1. Inputs: BNC, 8-pin mini-DIN. Battery Power: Four AA (sold separately). Battery Life: 2000 hours.

Metrology: pH Meter, OrionStar_A111, Overview

1. To turn on or off the meter, press ⏻ key.
2. To exit any meter function, press the **measure (esc)** key. to return to the measurement mode.
3. The meter mode is shown at the top of the meter:

   MEAS – for measurement mode

   SETUP – for setup mode

   CAL – for calibration mode
4. The meter can be calibrated using up to three pH buffers.
5. Press **mode (enter)** to switch between reading pH, mV, RmV or temperature.

For additional setup menu information, refer to the reference guide. The reference guide is on the included CD and available at www.thermoscientific.com/water.

Metrology: pH Meter, Orion A111, Keypad

measure (esc)	*In the measurement screen:* Press to take a measurement. *In the setup screen:* Press to escape the setup menu. *In the calibration screen:* Press to abort calibration.		
⏻	Press to turn the meter on or off.	mode (enter)	*In the measurement screen:* Press to switch between modes. *In the setup screen:* Press to confirm the selection.
cal	Press to enter the calibration mode.	setup	Press to enter the setup mode.
store ▲	*In the measurement screen:* Press to store the data on the screen in continuous read mode and with data logging on. *In the setup screen:* Press to scroll up in the list of options.	▼ recall	*In the measurement screen:* Press to see the stored data. *In the setup screen:* Press to scroll down in the list of options.

pH
RmV
Press Cal for next point or Enter to finish
Press ▲▼ to scroll
Press ▲▼ to set value
Press Esc to exit
Press Enter to confirm

Display Icon	Description
MEAS	Indicates that the meter is in the measurement mode.
SETUP	Indicates that the meter is in setup mode.
CAL	Indicates that the meter is the calibration mode.
MAN	Shown when a manual calibration is being done and complete.
AUTO	Shown when using automatic buffer calibration (default setting) and has been completed.
	Shows the battery status (more bars = more power remaining). Blinks when power is low and the battery needs to be changed. Batteries included with and factory installed in the Orion Star A121 portable pH meter.)
	Shown when the meter is running on AC power. (Adapter included with the Orion Star A111 benchtop pH meter.)
AR	Shown when the meter is on AUTO-READ mode. Default setting. AR and unit of measurement will blink until the reading is stable. When the reading is stable it is held on the screen and AR is lit. Press (measure) to take a new reading.
READY	Unit of measurement will blink until the reading is stable. When the reading is stable, READY is lit.
2, 4, 7, 9, 10, 12	Buffer points that have been calibrated are displayed as follows:

Displayed Buffer Value	2	4	7	9	10	12
Calibrated USA Buffer Value (at 25°C)	1.68	4.01	7.00	-	10.01	12.46
Calibrated DIN Buffer Value (at 25°C)	1.68	4.01	6.86	9.18	-	-

	Appears after a complete calibration.
	Shows the electrode condition. If the icon has a slash through it, the electrode condition is bad. Consult the electrode user guide.
	Displayed when a reading is stored into the memory.
LOG	Displayed when viewing stored readings.
Secondary display	Shows temperature reading in measurement mode and setup menu in setup mode.
Primary display	Larger, lower display shows measured value in selected mode.
Instructions	Located below the primary display. These phrases aid in the setup menu and calibration modes.

Metrology: pH Meter, Orion A111, Display Terms

Metrology: pH Meter, Orion A111, pH Calibration Selection

1. In pH measurement mode, press **setup**.
2. Press **mode** (enter) twice.
3. Press ▲ to select automatic buffer recognition (AUTO) or manual calibration (MAN).
4. If automatic buffer recognition was chosen, press **mode** (enter). Press ▲ to select USA or DIN buffer set for automatic buffer recognition.

   Note: *USA buffer points are: 1.68, 4.01, 7.00, 10.01 & 12.46. DIN buffer points are 1.68, 4.01, 6.86 & 9.18. The default buffer set is for USA buffers.*

5. Press **mode** (enter) to save configuration and **measure** (esc) to return measurement mode.

Metrology: pH Meter, Orion A111, Calibration

1. Prepare the pH electrode according to the electrode instructions.
2. Connect the electrode and ATC probe, if separate, to the meter. Press the ⏻ key to turn on the meter and press **mode (enter)** to display pH for pH measurement mode.
3. Select fresh pH buffers. If calibrating more than one point (highly recommended), select pH buffers that bracket the expected sample pH and are at least one pH unit apart.
4. Press **cal** Rinse the electrode (and ATC probe, if separate) with distilled water, blot dry and place into the buffer.
5. Wait for "**READY**" to appear.
   a. With automatic buffer recognition (default, AUTO CAL appears at the top of the display): to calibrate additional points, repeat steps 4 and 5a.
   b. With manual calibration (MAN CAL appears at the top of the display): press ▲ or ▼ keys to set value. To calibrate additional points repeats steps 4 and 5b.
6. When finished, press **mode (enter)** to save and end calibration.
   a. For one-point calibration, press ▲ or ▼ to edit the slope to match prior calibration (if desired) and press **mode (enter)** to save and return to measurement mode.
   b. For two- or three-point calibration, the average slope (SLP.A) will be displayed and the meter will automatically proceed to measurement mode.

Metrology: pH Meter, Orion A111, Measurement

1. Prepare the pH electrode according to the electrode instructions. Press **mode (enter)** to display pH for pH measurement mode.
2. Rinse the electrode (and ATC probe, if separate) with distilled water, blot dry and place into the sample.
3. If the meter is in AUTO-READ mode (meter default) press **measure (esc)** . If the meter is in continuous read mode, the meter will immediately start taking readings. Record the pH and temperature of the sample when "READY" is displayed and "pH" stops blinking.

   Note: *If in AUTO-READ mode and memory storage is enabled, the reading will automatically be stored when the "AR" appears. If in continuous read mode and memory storage is enabled, press* **store** *to store into the meter's memory.*

4. Remove the electrode (and ATC probe, if separate) from the sample, rinse with distilled water, and blot dry. To continue taking measurements , place electrode (and ATC probe, if separate) into the next sample and repeat steps 3 and 4.
5. When finished measuring all samples, store electrode according to electrode instructions.

Metrology: pH Meter, Orion A111, Read Type Selection

1. In measurement mode, press **setup** .
2. Press ▲ in setup until "4.0" is shown on the top line and "READ" is shown on the lower line. Press **mode (enter)**.
3. Press ▲ or ▼ to select the measurement mode:

   CONT = Continuous

   AUTO = AUTO-READ™
4. Press **mode (enter)** to save selection. Press **measure (esc)** to return to measurement mode.

Metrology: pH Meter, Orion A111, Reviewing pH Slope Data

1. In pH measurement mode, press **setup**. Press ▲ five times so that "6.0" is on the top, secondary display and "CAL" is on the larger, primary display.
2. Press **mode (enter)** to view slope. If a 3-point calibration was done, press ▲ to view the second slope segment, and ▲ again to display the average slope (SLP.A).
3. Press **measure (esc)** to return to measurement mode.

Metrology: pH Meter, Orion A111, Storing and Reviewing Readings

Storing Readings

This meter stores up to 50 readings.

To automatically store readings into memory after each stable reading:

1. In measurement mode, press **setup** .
2. Press ▲ in setup until "4.0" is shown on the top line and "READ" is shown on the lower line. Press **mode (enter)** .
3. Press ▲ or ▼ to show "AUTO" on the second line. Press **mode (enter)** to save selection.
4. Press ▲ to show "5.0" on the top line and "LOG" on the lower line. Press **mode (enter)** .
5. Press ▲ to show "ON" on the second line. Press **mode (enter)** to save selection.
6. Press **measure (esc)** to return to measurement mode. Each time the reading is locked onto the screen with the "AR" icon. The reading will automatically be stored in the datalog.

Review Stored Readings

1. In measurement mode, press **recall**.
2. Press ▲ or ▼ to scroll through the memory points.
3. Press **mode (enter)** to review the reading stored at that point.

Metrology: pH Meter: Handheld; Hanna, Checker with Screw-on Electrode

Calibration screws (small) located in the top of the device head

HI 1270 Electrode Replaceable screw-on. Clean only in tap water.

Link to Hanna Checker User Manual (pdf)

Metrology: pH Meter: Hanna "Checker" Initial Preparation

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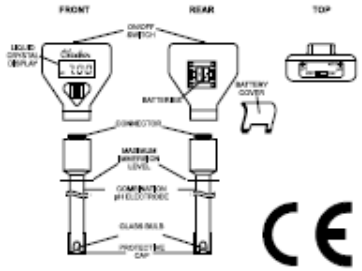
professionalequipment.com/images/pdf/w1100_manual.pdf

1 / 2 90% Find

Go Links

Checker® Checker® Checker® Checker®

Checker® 1: with **HI 1270** screw-type pH electrode
Checker® 2: with **HI 1207** screw-type pH electrode
Checker® 3: with **HI 1208** BNC-type electrode



CE

SPECIFICATIONS:

Range	0.00 to 14.00 pH
Resolution	0.01 pH
Accuracy (@20°C/68°F)	±0.2 pH
Typical EMC Deviation	±0.1 pH

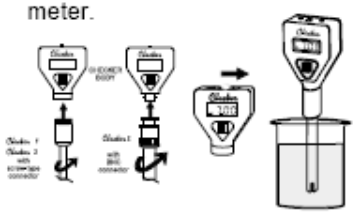
Calibration	Manual two points
Electrode:	combination stick pH electrode
Checker® 1:	**HI 1270 (included)**
Checker® 2:	**HI 1207 (included)**
Checker® 3:	**HI 1208 (included)**
Environment	0 to 50°C (32 to 122°F); 95% RH max.
Battery Type	2 x 1.4V alkaline
Life	approx. 3,000 hours of continuous use
Dimensions	66 x 50 x 25 mm (2.6 x 2 x 1")
Weight (meter)	70 g (2.5 oz.)

INITIAL PREPARATION:

The pH electrode is shipped dry. Prior to using the Checker®, remove the protective cap and condition the electrode by soaking the tip (bottom 4 cm/1½") in pH 7.01 buffer solution for a couple of hours. Then follow the calibration procedure below.

OPERATION:

- Do not be alarmed if white crystals appear around the cap. This is normal with pH electrodes and they dissolve when rinsed with water.
- If the electrode is dry, soak it in tap water for a few minutes, prior to use.
- Connect the electrode to the meter.



- Switch the Checker® on.
- Remove the protective cap and immerse the tip of the electrode (bottom 4 cm/1½") into your sample.
- Stir gently and wait until the display stabilizes.
- For best results, recalibrate periodically.
- NEVER IMMERSE THE ELECTRODE UP TO THE CONNECTOR. ALWAYS KEEP THE CONNECTOR CLEAN AND DRY.
- After use, rinse the electrode with water to minimize contamination.
- Store the electrode with a few drops of ***HI 70300 Storage Solution*** in the protective cap.

- DO NOT USE DISTILLED OR DEIONIZED WATER FOR STORAGE PURPOSES.
- Always replace the protective cap after use.

Storage: DO NOT use DI water

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Metrology: pH Meter: Hanna "Checker" Calibration

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Back Search Favorites

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2 / 2

Tiny adjustment screws for calibration

Checker® Checker® Checker® Checker®

CALIBRATION:

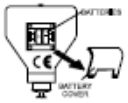
- Dip the tip of the electrode (bottom 4cm/1½") in a sample of pH 7.01 buffer at room temperature. Allow the reading to stabilize.
- Use a small screwdriver to adjust the pH 7 trimmer until the display reads "7.01".
- Rinse the electrode with water and dip it in a sample of pH 4.01 (or 10.01) buffer solution. Allow the reading to stabilize.
- With a small screwdriver adjust the pH 4/10 trimmer until the display reads the chosen buffer value.

- Calibration is now complete.

ALWAYS USE FRESH BUFFERS FOR CALIBRATION

BATTERY REPLACEMENT:

Replace the batteries when the display fades, or Checker® cannot be switched on.
Remove the battery cover on the back of the meter. Insert 2 new 1.4V batteries while paying attention to their polarity.
Batteries should only be replaced in a safe area using the battery type specified in this instruction manual.



ACCESSORIES:

HI 1207	Combination pH electrode 12 mm diameter with screw-type connector
HI 1208	Combination pH electrode 12 mm diameter with BNC connector
HI 1270	Combination pH electrode, 9 mm diameter with screw-type connector
HI 70300M	Storage solution (230 mL)
HI 76504/P2	2x1.4V alkaline batteries

Choose from the following 20 mL sachet solutions:

HI 70000P	Electrode cleaning/rinse solution (25 pcs.)
HI 70004P	pH 4 buffer solution (25 pcs.)
HI 70007P	pH 7 buffer solution (25 pcs.)
HI 70010P	pH 10 buffer solution (25 pcs)

SUGGESTIONS FOR USERS:

Before using this product, make sure that it is entirely suitable for the environment in which it is used. Operation of this instrument in residential areas could cause interference to radio and TV equipment. The glass bulb at the end of the pH electrode is sensitive to electrostatic discharges. Avoid touching this glass bulb at all times. During operation of instrument, ESD wrist straps should be worn to avoid possible damage to the pH electrode by electrostatic discharges. Any variation introduced by the user to the supplied equipment may degrade the instrument's EMC performance. To avoid electrical shocks, do not use this instrument when voltage at the measurement surface exceeds 24 VAC or 60 VDC. To avoid damage or burns, do not perform any measurement in microwave ovens.

Checker® is a registered Trademark of "Hanna Instruments"

PROFESSIONAL EQUIPMENT

HANNA instruments

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Metrology: pH Meter ; Electrodes, Orion-Thermo, Standards

Epoxy-Body Sure-Flow®
Combination pH Electrode with BNC Connector
Recommended use : General purpose, ideal for dirty, difficult samples such as soils, sludges, colloids, viscous solutions. Easy to-clean-junction, De**tachable bulb guard (Orion 910005) included**

9165BNWP
pH Range
0 -14
Temp.Range
0 - 90°
Internal Ref.
Ag/AgCl
Junction
Sure-Flow
Dimensions
120 mm x 12 mm

Metrology: Balance; Ohaus, Student, Scout Pro

Scout* Pro Portable Top-Loading Balances, Ohaus*
Supplier: Ohaus

Readability, mg	Capacity, g	Repeatability mg	Linearity, mg		Pan Size, cm (in.)	Ohaus No.	VWR Catalog#	Unit Price
.01	600	.01	±0.02	1	2 (43/4)	SP602	97000-038	

Quick and easy-to-use with large weighing pan and simple two-button operation. Units are equipped with mechanical and software protection. Selectable weighing units: g, kg, oz., lbs., combined lbs./oz., oz. t, and dwt. Perfect for parts counting (with automatic optimization), display hold, percent weighing, and totalization (to display limit). Large 1.5cm (5/8"), high-contrast LCD screen is angled for optimum viewing. Sealed front panel and spill ring for spill protection. Easy span and linearity calibration. Span calibration mass is included on the 200g, 400g, and 600g models (11379-234, -236, -238, and -240). User-selectable auto shut-off. Tare range: to capacity by subtraction. Standard features include: weigh-below hook, stability indicator, over/under load error indicator, low battery indicator, integral security bracket, and shipping lock.

Stabilization Time: 3 seconds
Dimensions: 19.2W x 5.4H x 21D cm (71/2 x 21/8 x 81/4")
Operating Temperature: 10 to 40°C (50 to 104°F)

Metrology: Balance, Digital, Ohaus Scout-Pro, Calibration

Begin with the balance turned off

Step 1: Press & hold the ON/ZERO button until you see MENU on the display

Step 2: Release the ON/ZERO button. Display should now read .C.A.L.

Step 3: Press the ON/ZERO button one time (do not hold). Display should briefly flash -C- and then flash the weight of the calibration mass needed

Step 4: Place appropriate calibration mass on pan and press ON/ZERO button. Display will again flash -C- and then DONE

Step 5: Remove mass from pan and your balance is now calibrated!

(Note: If display reads ERR1 or ERR4 follow manual instructions for linearity calibration)

Hotlink to Ohaus Scout Pro User Manual……(pdf)

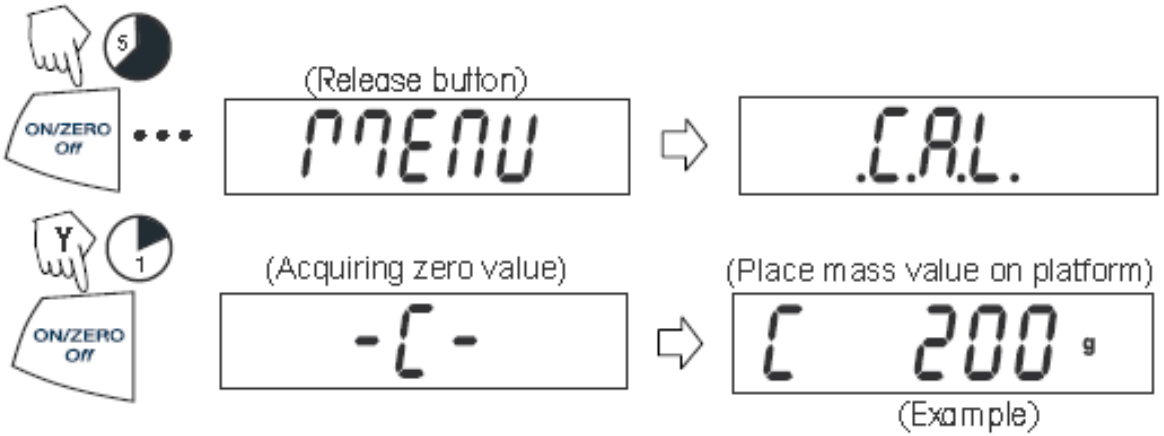
Calibration

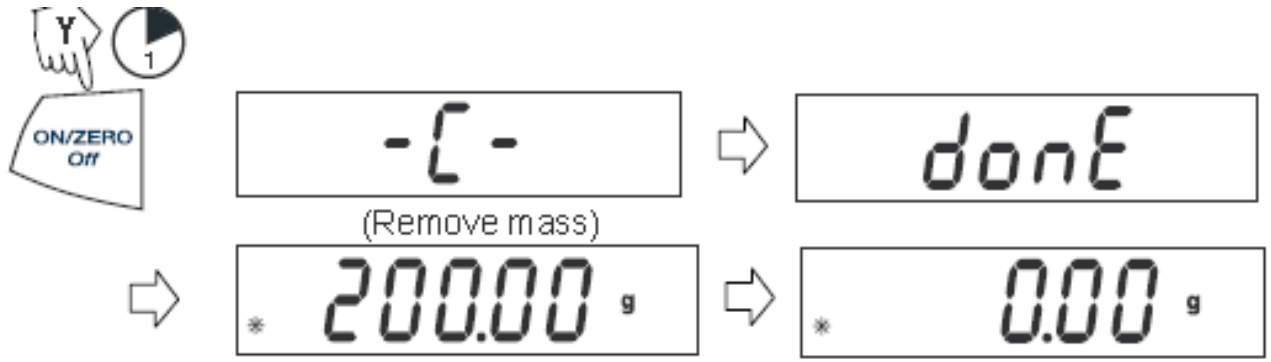
Span Calibration

Span calibration uses two calibration points, zero and a specified calibration weight. Before beginning calibration, make sure the Lock Switch is off. Clear the platform.

NOTE: *Value of calibration mass depends on capacity of balance.* After calibration, the balance returns to the currently selected weigh mode.

Start with the balance OFF.

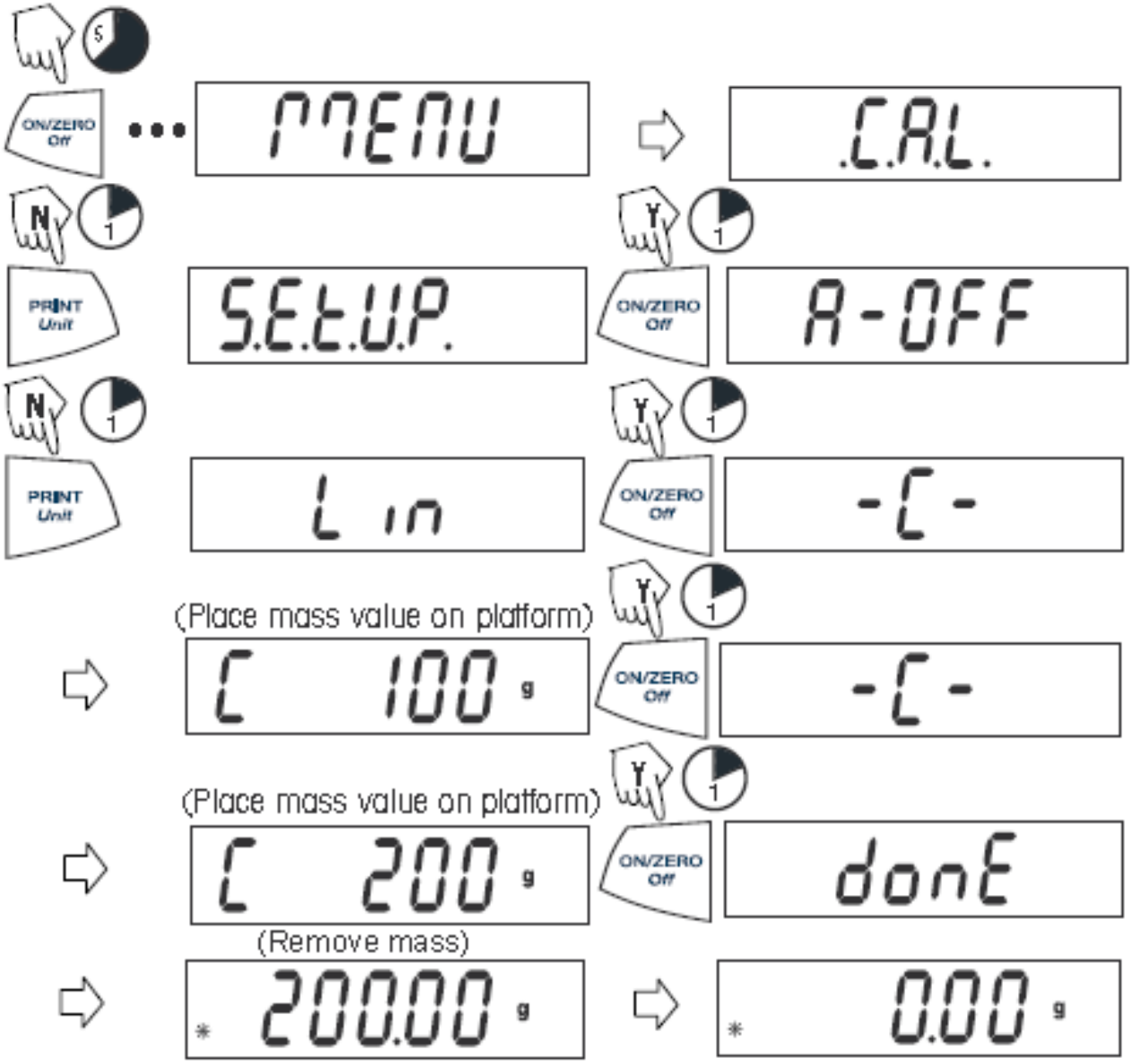




Metrology: Balances, Ohaus Scout-Pro, Span Calibration Details

Linearity Calibration

Linearity calibration uses three calibration points; zero, mid-scale and full scale. Lin Cal must be selected and set to YES in the **.S.E.T.U.P.** Menu. Before beginning calibration, make sure the menu Lock Switch is off. Clear the platform. Start with the balance OFF.



Metrology: Balance, Ohaus Scout-Pro, Linearity Calibration

Metrology:Balance; Analytical,Ohaus, Voyager Pro

Readability, mg	C apacity, g	Repeatability mg	Linearity, mg	Pan Size, cm (in.)	Ohaus No.	VWR Catalog#	Unit	Price
.1	110	0.1	±0.2	9 (3.5) dia.	VP114CN	73750-126	Each	$3,355.00

Tare Range: Full capacity by subtraction
Stabilization Time: 4 seconds
Operating Temperature Range: 10 to 40°C (50 to 104°F)
Display Size: 240 x 128 pixels
Calibration: Internal/External
Dimensions: 21W x 35H x 35D cm (85/16 x 1313/16 x 1313/16")
Electrical: 100–120V, 220–240V, 50/60 Hz
Shipping Weight: 9.1 kg (20 lbs.)

Analytical balances have capacities up to 210g and a readability of 0.1mg for maximum accuracy. The draft shield design and contoured fit provide optimum protection from wind currents for superior balance stability and reproducibility in challenging environments.

Weighing units supported include g, mg, oz, oz t, ct, dwt, taels (3), mommes, gn, ti, N, and a custom unit. User-selectable filter, stability indicator, and auto-zero tracking for use in difficult environments. Five-language operational display text. Standard weigh below capability. Protective in-use cover and security bracket. Additional standard features include an ergonomic leveling system with up front level, cursor keys for menu navigation and balance setup, one function per key, auxiliary port, menu and calibration lock-out switch, factory reset option, spill gutter, and removable draft shield doors.

Manufactured to ISO 9001:2000 quality assurance specifications. CSA certified to CSA 1010-1, UL 3101-1, and IEC 1010-1. FCC approved. User selectable GLP outputs via RS232 to meet traceability requirements.

Hotlink to Ohaus Voyager Pro User Manual……(pdf)

Metrology: Balance; Ohaus,Adventure-Pro,

AV114C Analytical, Adventurer Pro w Internal Calibration

Full duplex RS-232 serial interface
Ergonomic leveling system
Protective in-use cover
Large backlit Liquid Crystal Display (LCD)
Integral security bracket
Below balance weighing
GLP data output capability
Stability, overload, underload, low battery indicator
Programmable auto shut-off
Adjustable environmental settings
Battery or AC operation (AC adapter included)

Enhanced balance software including multiple span calibration points, auto tare, and output layout options including single or multiple lines, four-line feed and form feed Parts counting; weighing, animal/dynamic weighing, checkweighing, percentage weighing, totalization, display hold

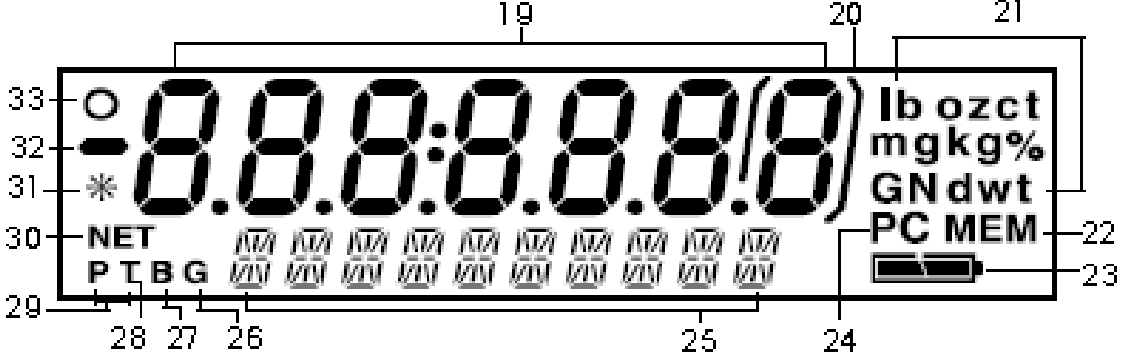
MODEL CODE	ITEM NR.	CAPACITY	READABILIT	PLATFORM	
AV114C	80103739	110g	0.1mg	90mm	Internal Calibration

Hotlink to Ohaus Adventure Pro User Manual……(pdf)

Metrology:

Balance;
Ohaus,Adventure-Pro,

Controls and Display Overview



Digital Display Window

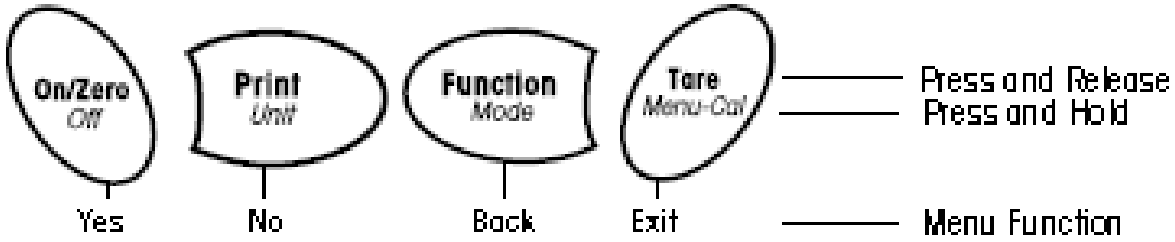
TABLE 3.1-1 ADVENTURER PRO CONTROLS AND DISPLAY FUNCTIONS.

No.	Description	No.	Description
1	On / Zero / Off / Yes Button	18	Lock Switch
2	Print Unit / No Button	19	Primary (7 segment) display
3	Level Bubble	20	Brackets
4	Function Mode / Back button	21	Units of Measurement
5	Tare Menu-Cal / Exit Button	22	Memory Indicator
6	Display	23	Battery Strength Indicator
7	Pan	24	Pieces Indicator
8	Type label on side of housing	25	Secondary (14 Segment) Display
9	Data label	26	Gross Indicator
10	Weigh Below Opening	27	Brutto Indicator
11	Battery Compartment	28	Tare Indicator
12	Leveling feet	29	Preset Tare Indicator
13	COM 1 Connector	30	Net Indicator
14	COM 2 Connector (AV...R and AV...U Models only)	31	Stability Indicator
15	Wind Ring	32	Negative Indicator
16	Draft Shield	33	Center of Zero Indicator
17	Power Connector		

Metrology: Balance;

Ohaus,Adventure-Pro,

Buttons and Control Functions



Primary Function	**On/Zero** • If balance is off, turns balance on. • If balance is on, sets zero.	**Print** • Sends current display value to the serial interface.	**Function** • Operation is dependent on the application mode.	**Tare** • Performs tare operation.
Secondary Function	*Off* • Turns balance off.	*Unit* • Change weighing unit.	*Mode* • Change application mode.	*Menu-Cal* • Enter the User menu. Calibration is the first sub-menu.
Menu Function	Yes • Accepts the current (blinking) setting on the display.	No • Rejects the current setting (blinking) on the display. • Increments a value being entered.	Back • Reverts back to previous menu item. • Decrements a value being entered.	Exit • Immediately exits menu mode. • Aborts a calibration in progress.

3.3.1 Setting the Balance to Zero

Remove the load from the pan and press the **Zero** button to set the display to zero.

When the weighing pan or platform is empty, The Center of Zero indicator turns on when the measurement is within ± 1/4 d of the zero setting.

3.3.2 Taring

Taring refers to the action of allowing for the weight of a container so that only the weight of objects held in the container (net weight) is displayed.

Metrology: Balance;
Ohaus,Adventure-Pro,
Zero and Taring

To Tare

Place the empty container on the pan and press the **Tare** button.

Add material to the container. The net weight of the material is displayed.

To clear the Tare value, remove the container from the pan and press the **Tare** button.

Auto Tare

Auto Tare automatically compensates for container weight so the balance displays net weight.

Auto Tare must be set ON in the Setup sub-menu (See Section 3.7.2 Setup Sub-menu).

The secondary display shows PLACE CONTAINER (blinking). When the container is placed on the pan, it is automatically tared and Net weight is displayed. The Tare value is automatically cleared when the container is removed from the pan.

Preset Tare

Use the xT command in the command table to enter a preset tare value through a computer.

To clear the Tare value, enter a value of 0.0. See Section 5.4.1.

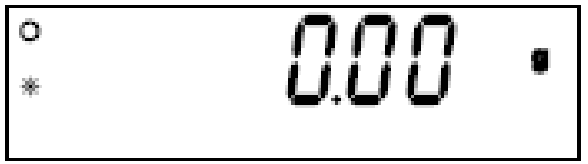
Metrology: Balance; Ohaus, Adventure-Pro, Weighing

Use this mode to determine the weight of items in the selected unit of measure. The Adventurer Pro is shipped with grams enabled. Before using other units of measure, these units must be turned on in the Unit menu (See Section 3.7.5).

Weigh

Press and hold **Mode** until the display shows WEIGH, then release the button.

Press **Zero** to zero the balance.



Place objects to be weighed on the pan to display the weight.

The example displays a 200 gram weight.

Metrology: Balance; Ohaus, Adventure-Pro, Parts Counting pg 1/2

Use the Parts Counting Mode to count samples of uniform weight.

Press and hold *Mode* until Count is displayed, then release the button.

Establish an Average Piece Weight (APW).

Each time a new type of part is counted, the nominal weight of one piece (Average Piece Weight) must be established using a small quantity of pieces. This APW is stored until replaced by another APW.

If an APW has already been established, Count is displayed with Clear APW? blinking.

Press No to use the previously saved APW.

Otherwise, press Yes to establish a new APW.

(Clear APW? blinking)

The current weight (0.00) is shown on the primary display and the default sample size (PLACE 10) is shown on the secondary display.

To change the sample size, press and hold the No button to increment the sample size through the range of 1 to 100. Release the button when the desired sample size appears on the secondary display.

Metrology: Balance; Ohaus, Adventure-Pro, Parts Counting pg 2/2

Place the specified number of parts on the pan.

Press the Function button to accept. The primary display will now indicate the number of parts. The weight is shown on the secondary display.

Pressing the Function button momentarily displays the APW on the secondary display. The example shows an APW of 2.000g.

Clearing the APW

Press and hold the *Mode* button until COUNT is shown on the secondary display.

APW Optimization

The only adjustment for Parts Counting is APW Optimization. APW Optimization is set On or Off in the Mode menu when Parts Counting is turned On. When APW Optimization is set on, the APW is automatically optimized. This results in more accurate parts counting. The factory default is On. When a new APW has been established, APW Optimization occurs when the number of pieces added to the pan are between one and three times the number already on the pan. The secondary display will momentarily indicate APW OPT.

Metrology: Balance; Ohaus, Adventure-Pro, Totalize

Totalize measures the cumulative weight of items. Refer to Section 3.4.3 to enable totalizing.

Press ***Mode***, then release the button when Totalize is displayed. The primary display shows the current weight. The secondary display alternates between TOTALIZE and the current totalized weight.

Adding Weight to the Total Automatic Mode

Place the item on the weighing pan. The weight of the item is shown on the primary display. The weight of the item is added automatically to the total weight and the new total is shown on the secondary display. Remove the item from the weighing pan, then add the next item.

Manual Mode

Place the item on the weighing pan. The weight of the item is shown on the primary display. Press the **Function** button to add the weight of the item to the total. The new total is shown on the secondary display. Remove the item from the weighing pan, then add the next item.

Clearing the Totalized Weight

Press and hold the ***Mode*** button until TOTALIZE is shown on the secondary display.

Metrology: Balance; Ohaus, Adventure-Pro, Calibration

Adventurer Pro balances offer a choice of five calibration methods: Internal Calibration (InCAL™), Span Calibration, Linearity Calibration, Calibration Test™ and Calibration Adjust.

- *InCal ™* - For models equipped with Internal calibration (InCAL™), calibration of the balance is accomplished by an internal mass.
- *Span* - Span calibration ensures that the balance reads correctly within specifications using two weight values: zero and a weight value between 25% and 100% of the balance's capacity.
- ***Linearity*** - Linearity calibration minimizes deviation between actual and displayed weights within the balance's weighing range. Three weight values are used: zero, a weight value at midpoint of the balance's weighing range, and a weight value at or near the balance's specified capacity.
- *Cal Test* - Calibration test allows the stored calibration data to be tested against the current mass being used for the test.
- *Cal Adj* - For models equipped with InCal™, allows adjustment of the internal calibration.

Notes: Calibration may be locked out to prevent unauthorized personnel from changing calibration. if calibration has been locked out, you can only access Cal Test on InCal™ models.

Before beginning calibration, have masses available. Masses required for calibration are listed in the table in section 3.7. 2. Default Span Calibration Points are shown in Bold print.

Metrology: Balance;

Ohaus,Adventure-Pro,

Internal Calibration, Span Calibration

Models equipped with the internal calibration can be calibrated without using an external weight. With the balance on, press and hold the ***Menu-Cal*** button until MENU CALIBRATE is displayed, then release the button.

Press **Yes** to initiate the internal calibration process. When internal calibration is finished, the balance returns to the currently selected mode.

Span Calibration

With the balance on, press and hold the ***Menu-Cal*** button until MENU is displayed, then release the button. CALIBRATE (blinking) is displayed.

Note: If the balance has InCal, press the **No** button to advance to span calibration.

Press the **Yes** button to enter span calibration.

Press the **Yes** button to initiate span calibration.

First the zero reading is taken. Next the display shows the default span calibration weight value.

Press **No** to change to an alternate calibration weight. Press **Yes** when the desired calibration weight is displayed.

Place the specified calibration weight on the platform. After calibration, remove the weight from the platform.

To abort calibration at any time, press the **Exit** button.

NOTICE:

Linearity Calibration is required only if the linearity error exceeds tolerance in specification table.

With the balance on, press and hold the ***Menu-Cal*** button until MENU CALIBRATE is displayed, then release the button. CALIBRATE (blinking).

Press the **Yes** button to enter calibration.

Note: If the balance has InCal, press the **No** button to advance to linearity calibration. CAL LINEARITY (blinking) is displayed.

Press the **Yes** button and follow the screen instructions. Use the weight values shown on the primary display.

First the zero reading is taken. Next the display shows the first calibration weight value. PUT WEIGHT (blinking) is displayed. Place the specified calibration weight on the platform.

After a few seconds, place the second specified calibration weight on the platform. PUT WEIGHT (blinking) is displayed. After a few seconds, the calibration weight is displayed.

LINEAR DONE is momentarily displayed when calibration is completed.

After calibration, remove weight from platform. To leave the menu, press **Exit**.

To abort calibration at any time, press the **Exit** button.

Metrology:
Balance;
Ohaus,Adventure-Pro,
Linearity
Calibration

Metrology: Balance; Ohaus,Adventure-Pro, Calibration Test

Calibration test allows a check of a known calibration mass against the last stored calibration information in the balance.

Press and hold the ***Menu-Cal*** button until MENU CALIBRATE is displayed.

Press **Yes** to enter calibration.
Press **No** until CAL TEST is displayed.

Press **Yes** and follow the screen instructions.

Place the specified weight on the platform. After a short period, the display indicates the difference in weight from the last calibration, and then will display the calibration weight on the platform. After the test, remove the calibration weight from the platform. To leave the menu, press **Exit**.

(Example)

Metrology: Balance; Ohaus,Adventure-Pro, Calibration Adjust

Calibration Adjust may be used to adjust the result of the internal calibration by ±100 divisions.

Note: Before making a calibration adjustment, perform an internal calibration. To verify whether an adjustment is needed, place a test mass on the platform and note the difference (in divisions) between the nominal mass value and the actual reading. Refer to Section 3.7.2 and use the highest value from the Span Calibration Points column as the test mass. If the difference is within ±1 division, calibration adjustment is not required. If the difference exceeds ±1 division, calibration adjustment is recommended. Following a calibration adjustment, repeat the internal calibration and verification procedures.

To perform a calibration adjustment, press the ***Menu-Cal*** button and release it when MENU CALIBRATE is displayed.

Press **Yes** to enter the Calibration sub-menu. Press **No** until CAL ADJ is displayed.

Press **Yes** to enter the CAL ADJ menu item and view the current setting. If the actual reading was less than the nominal mass value, a positive adjustment is required. Press **No** until the setting matches the difference noted earlier in the procedure. If the actual reading was greater than the nominal mass value, a negative adjustment is required. Press **Back** until the setting matches the difference noted earlier in the procedure. Press **Yes** to accept and store the setting.

Metrology: Calibration Weights, Troemner 2Kg to 1mg

Category: Metric Economical Stainless Steel Calibration Weight Sets
Capacity: 4111.11 g
Class: Class 7 (See ANSI/ASTM Metric Tolerance Chart)
Certification: Statement of Accuracy (View Sample)
Material: 2kg-1g weights are 303 stainless steel, 500mg and 200mg weights are 304 stainless steel and 100mg and below are aluminum
Construction: 2000g-200g weights are 2 piece construction with handling knob. 100g weights and below are 1 piece construction with no adjusting cavity with one end turned up for easy handling.
Dimensions: Call for exact dimensions
Weight Set Configuration: 2000g, 1000g, 500g, 2-200g, 100g, 50g, 2-20g, 10g, 5g, 2-2g, 1g, 500mg, 2-200mg, 100mg, 50mg, 2-20mg, 10mg, 5mg, 2-2mg, 1mg
Case: Supplied with integrally hinged molded master box with carrying handle including integrally hinged red polypropylene box inside the master box.
Part Number: 338-01S, SN 13669, Certified 5/25/12

Metrology: Balance, Digital, Denver Instr, Apex Series (replaces continued XS-series)

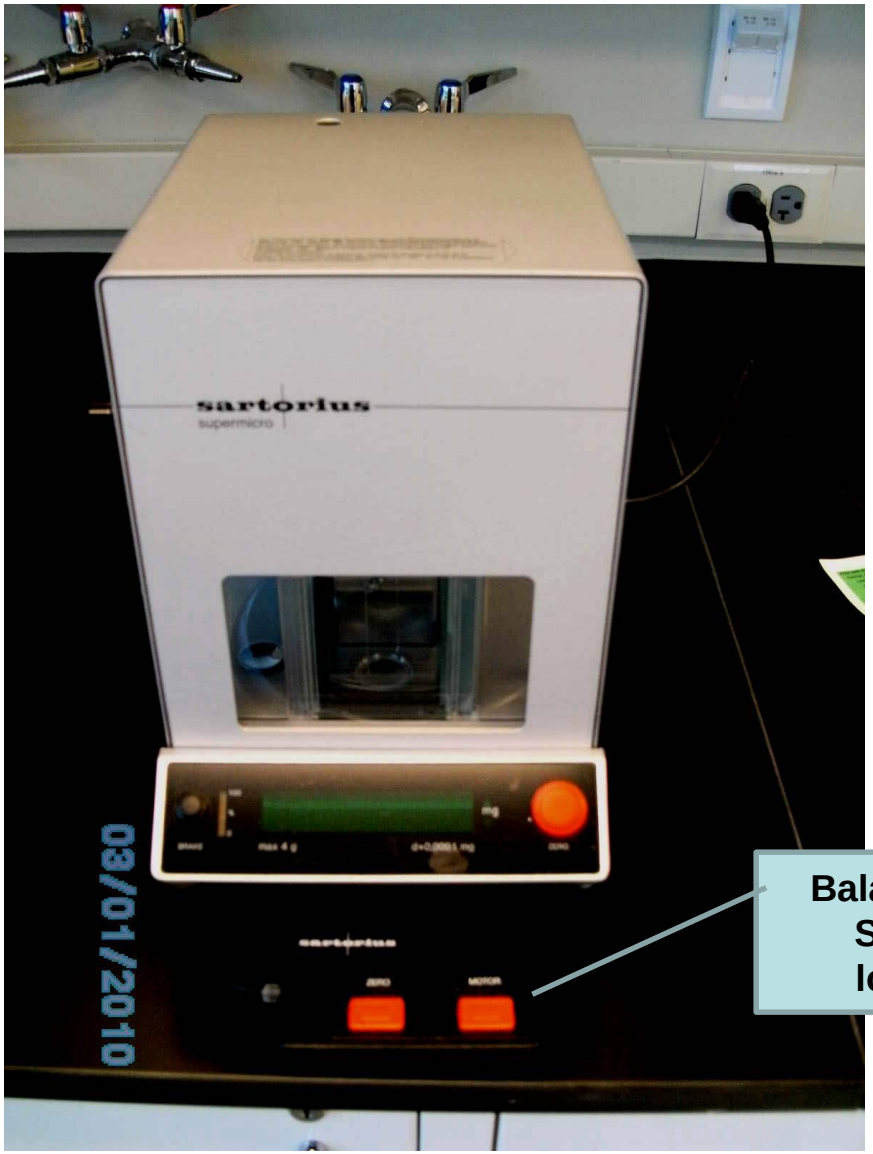
Specifications

Model	APX-60	APX-100	APX-200	APX-153	APX-203	APX-323
Capacity	60g	100g	200g	150g	200g	320g
Readability	0.1mg	0.1mg	0.1mg	0.001g	0.001g	0.001g
Taring Range	0 to 60g	0 to 100g	0 to 200g	0 to 150g	0 to 200g	0 to 320g
Repeatability	0.1mg	0.1mg	0.1mg	0.001g	0.001g	0.001g
Linearity	±0.2mg	±0.2mg	±0.2mg	±0.002g	±0.002g	±0.002g

Common Specifications

Analytical Unit Dimension (L x W x H) 12.6 x 8.7 x 12.8" (320 x 221 x 325mm)
Analytical Chamber Dimension (L x W x H) 6.25 x 7.5 x 9.25" (159 x 191 x 235mm)
Height Above Pan: 8.8" (224mm)
Analytical Net Weight 9.0 lbs. (4.1kg)
Toploader Unit Dimension (L x W x H) 12.7 x 8.8 x3.0" (322 x 224 x 76mm)
Toploader Net Weight 4.9 lbs. (1.8kg)
Stabilization Time (average): 5 seconds (Analytical Model)
3 seconds (Toploading Models)
Operating Temperature 10°- 30° C (50° - 86° F)
Electrical Requirements 15 to 17 VDC at 100mA

Metrology: Balance, SuperMicro, SatoriusS4, @BRDG

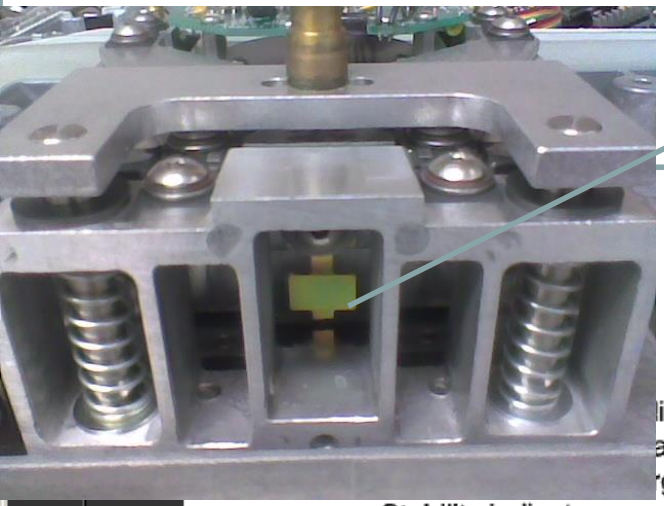


Inventory Only 3/2/10 RGM
Not Calibrated or Tested at this time.
(Gifted from Millipore Feb 2010)

Link to SatoriousS4 User Manual…pdf

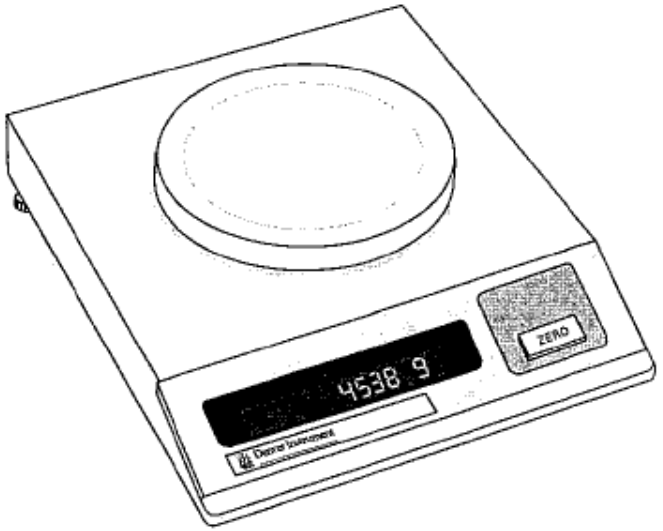
Balance control pad
Swings pan for load/unloading

Metrology: Balance, Digital, Denver Instrument XS-Series



Typical part that snaps if too much load is place on pad. Not repairable.

XS-SERIES
TOPLOADING BALANCES



- Stability indicator
- Rapid response time (2 seconds)
- Die-cast aluminum construction
- Stainless steel weighing pan
- Overload protection
- Below-pan weighing
- UL approved
- Spill cover
- DI's 5-year, no-nonsense warranty

SPECIFICATIONS

DI MODEL	DENVER INSTRUMENT CAT NO	CAPACITY	SENSITIVITY	PAN SIZE	REPEATABILITY	LINEARITY
XS-210	8529.1	210g	0.001g	4"	0.001g	±0.002g
XS-410	8530.1	410g	0.01g	5.5"	0.01g	±0.01g

Metrology: Temperature
Infrared (IR), Laser Sighting, Non-contact Thermometer

Fluke 62 Mini

Spectral range		7 to 18 µm
Temp range	expanded	-20 to 932°F (-30°C to 500°C)
Power		one 9 V battery
Dimensions		1.5"W x 6" H x 4"D
Sighting type		single point, offset laser
Display		LCD, backlit
Distance to target size ratio 10:1		
Emissivity		fixed at 0.95
Laser class		Class II
Accuracy		±1°C from 10 to 30°C, ±1.5% of reading or ±1.5°C
Resolution	F	±1% of reading, or ±2°F
	C	±1% of reading, or ±1°C
Response time		500 msec, 95% response

Notes:

- **Works well on most surfaces including those containing liquids (bath heaters)**
- **Note IR target diameter is about 1/10th of distance to target, NOT the size of the laser targeting beam**
- **Remove/open glass or other covers on devices before sighting on the specimen (ex: rotating incubators)**

Metrology:Wall Clock: Radio Controlled, Lacrosse, Analog

Chicago Lighthouse Clock:

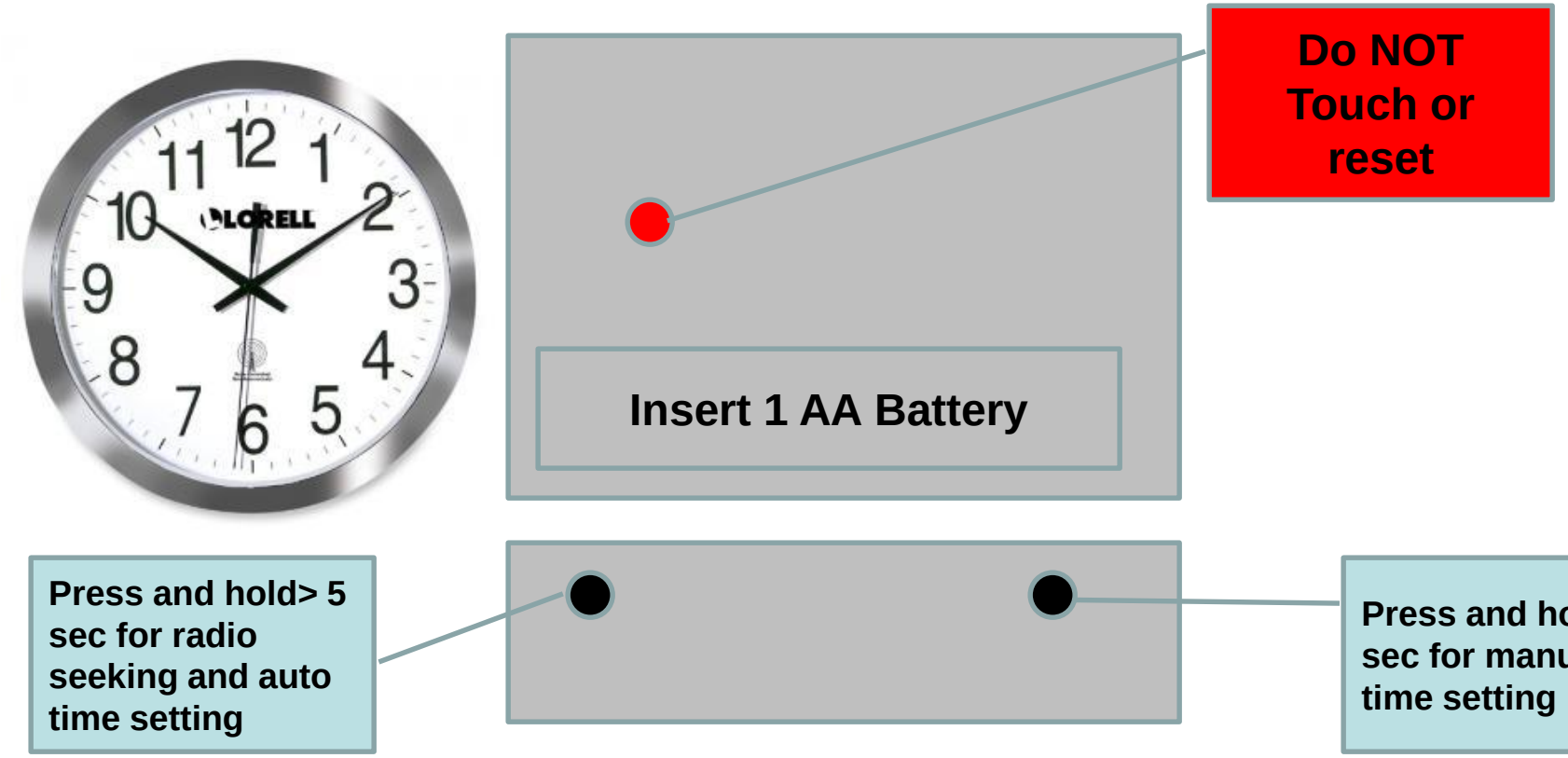
1. Turn gray wheel to set time about 5 minutes before actual true time
2. When second hand reaches 12:00, press and release RED button on back. You will hear a beep. If you don't hear a beep, remove battery and insert it backwards for one second, then replace in proper position. Repeat steps 1-2.
3. After the second hand has passed one hash mark PAST THE MINUTE HAND, press and release the RED button again. You should hear a beep, of not swap the battery per Step 2 and repeat all steps
4. The setup is now complete and the second hand will double-step until it receives the AM special signal and adjust to the correct time. Once a signal is received, the second hand will move normally.

Link to La Crosse Technology Clock Manual … pdf

Metrology:Clock; Radio Controlled, Lorell, @BRDG

Lorell Radio Controlled Wall Clock

Round profile wall clock is radio-controlled so the setting is modified each day to that of the atomic clock, accurate to one second per million years. The clock automatically adjusts to Daylight Saving Time. Design features an easy-to-read white dial, black Arabic numerals, and second hand sweep. Clock runs on one AA battery.


Do NOT Touch or reset
Insert 1 AA Battery
Press and hold> 5 sec for radio seeking and auto time setting
Press and hold> 5 sec for manual time setting

Rear of Clock Operations

Metrology: Gas Meter; Progard 4 Gas Monitor, LEL, O2, CO, HS

Devices(2) were given to STLCC_FV
Via B. Staerk to Bob Morrison
from Carl Voss, CVoss2@it.jnj.com
4/7/11: RGM.
Device stored in Bioprocessing R119 At CPLS.

Gas Sensing Performance

Gas	*Range*	*Resolution*	*Alarm*
Combustible Gas	0–100% LEL	1% LEL	10% LEL
Oxygen	0–25%	0.1%	Low: 19.5% High: 22.0%
Carbon Monoxide	0–1000 ppm	1 ppm	35 ppm
Hydrogen Sulfide	0–50 ppm	1 ppm	10 ppm

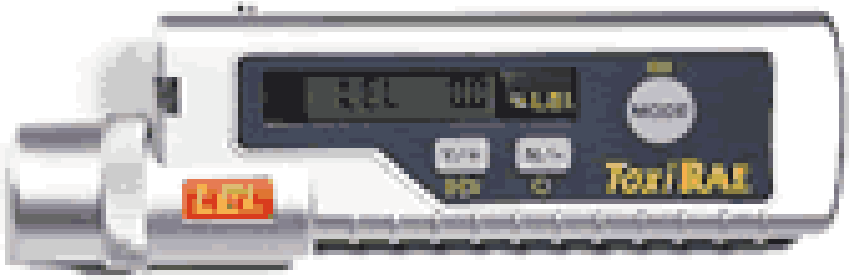
Operational Performance

Battery	Rechargeable or Alkaline	
Operating time	*Without Pump:*	
	NiCad	10 hours
	Alkaline	18 hours
	With Pump:	
	NiCad	8 hours
	Alkaline	16 hours
Warranty	Case & electronics	2 years
	Sensors	1 year

Safety Features

Function alarms	Low Battery Self test Pump flow blockage
Safety approvals OSHA/NRTL	Class I, Division 1, Groups A, B, C, and D Class II, Division 1, Groups E, F, and G Class III hazardous locations
Case	High-impact polycarbonate, stainless fiber-filled

Metrology: Combustible Gas Monitor, ToxiRae, PGM-37



Device was given to STLCC_FV
Via E. Lyons to Bob Morrison
from Carl Voss, CVoss2@it.jnj.com
3/9/11: RGM charged batteries, calibrated, Tested with Lab methane, prepared this SOP Page. Device stored in Bioprocessing R119 At CPLS.

Specifications

Size: 6.0"L x 1.75"W x 1.0"H (15.2 cm x 4.4 cm x 2.5 cm)
Weight: 6.9 oz with battery (197g)
Detector: Protected catalytic bead
Battery: Rechargeable, 4.8 V, 900 mAh, Ni-Cd battery pack or 4 AAA alkaline batteries
Operating Hours: 10 hours continuous
Display: 7 digit LCD with LED backlight
Key-Pads: 1 operation key and 2 programming keys
Attachment: Pocket/belt clip
Direct Readout: Percentage of lower explosion limit (LEL)
Intrinsic Safety: UL, cUL Class 1, Division 1, Group A,B,C,D (USA & Canada)
EEx ia IIC T4 (Europe)
Alarm:
90 dB buzzer and flashing red LED to indicate exceeded preset limits:
High - 3 beeps and flashes per second
Low - 2 beeps and flashes per second
STEL and TWA - 1 beep and flash per second Alarms latching with manual overide
Diagnostic alarm and display message for low battery, sensor or calibration error
Calibration: Two point field calibration for zero and span gas
Comfort beep: At 6 minute intervals
Temperature: -4º to 113º F (-20º to 45ºC)
Humidity: 0% to 99% relative humidity (non-condensing)

Metrology : Sensor/Alarms; Oxygen Level , GasBadge Pro

Industrial Scientific GasBadge® Pro Oxygen Single Gas Monitor**, I24181000603, $363.97 (AIRGAS**)

- Powerful audible alarm complemented by vibrating and visual alarms, standard
- Backlit display
- "Go/No Go" display mode
- User adjustable alarm and calibration gas setpoints
- Water resistant - IP66/67 (certified by a third party)
- Interchangeable "smart" sensors monitor oxygen or any one of many toxic gases
- Docking Station™ compatible
- One year datalogging capacity (minimum)
- Standard STEL and TWA
- Lifetime warranty
- Minimum 2,600 hours continuous operation from replaceable CR2 Lithium battery

Hotlink to GasBadge Pro User Manual …. pdf

Metrology : Gas Detection, Oxygen, Gasbadge Pro, Basic Operations

Countdown Screen

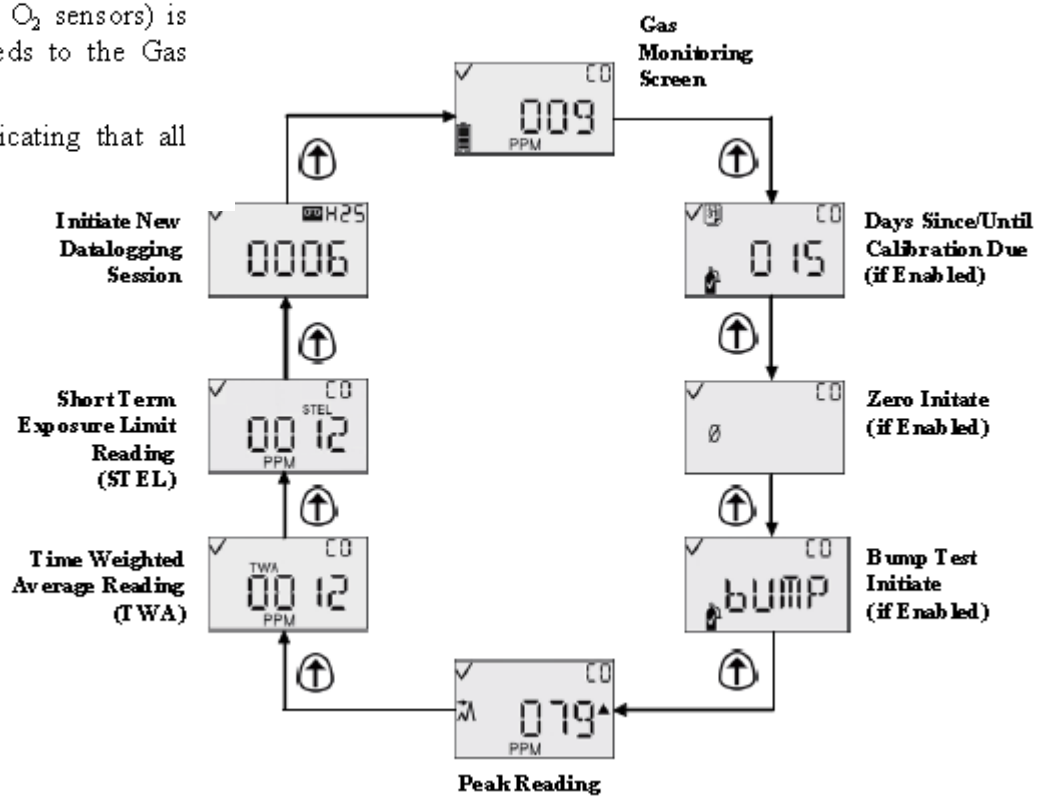
The countdown screen is entered after the Software Version screen times out. The primary display shows a decrementing countdown from 20 seconds.

Countdown Screen

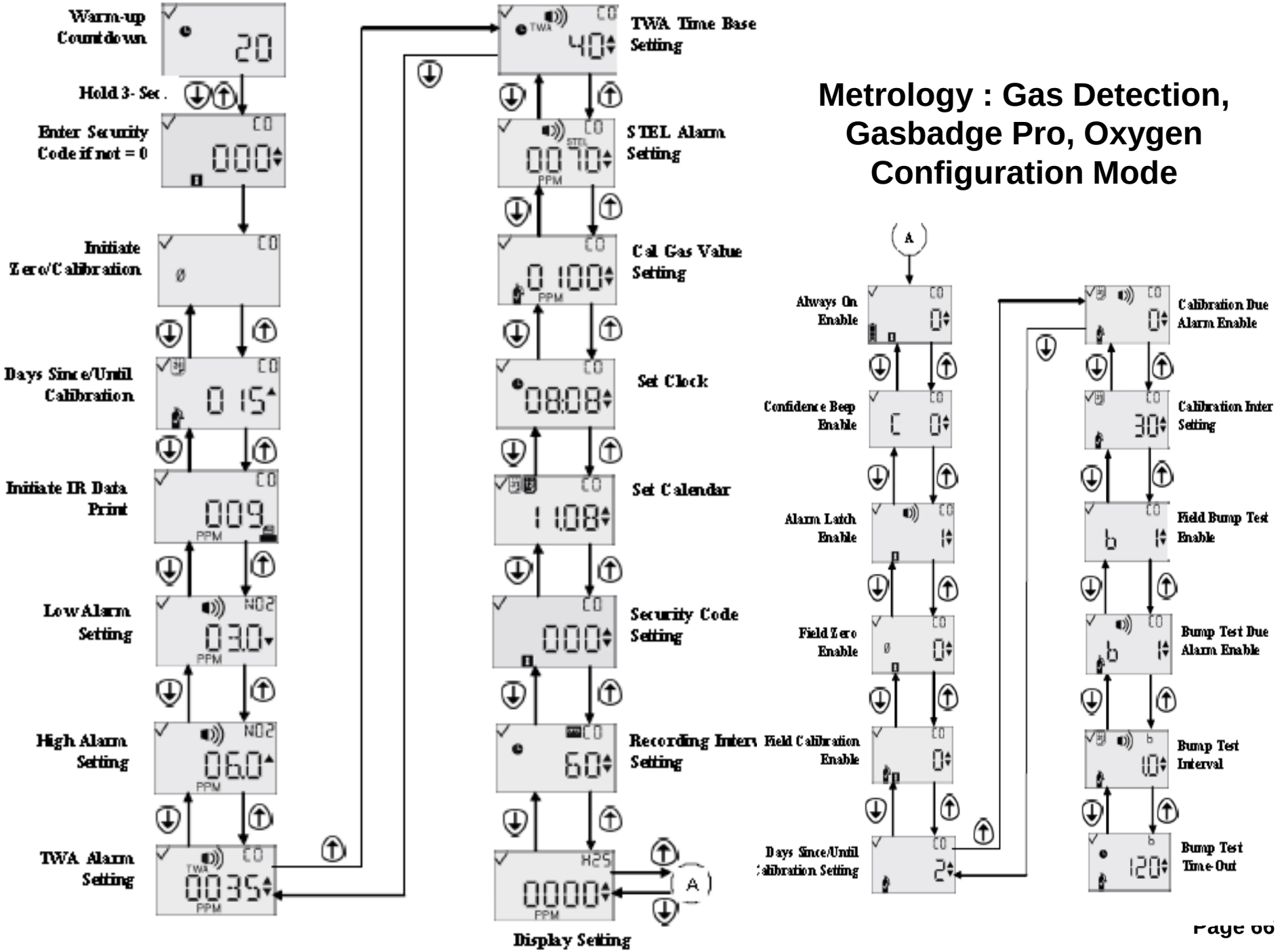
To enter the Configuration Mode, press the up and down arrow buttons simultaneously for 3 seconds during this countdown. The device will display the Enter Security Code screen (assuming the security code has been set to a number greater than zero).

If the security code is set to zero, then the Security Code screen is bypassed and the Zero Initiate screen (for toxic sensors) or Cal Initiate screen (for O_2 sensors) is displayed. If no buttons are pressed, the GasBadge Pro proceeds to the Gas Monitoring screen after the countdown reaches zero.

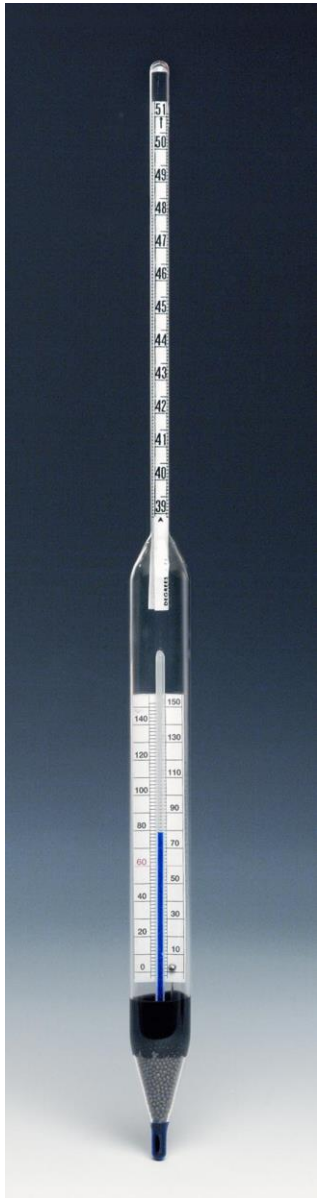
The confidence Checkmark indicator is active at this point, indicating that all internal checks have passed.



Metrology : Gas Detection, Gasbadge Pro, Oxygen Configuration Mode



Metrology: Hydrometer, specific Gravity



<u>Fisher Scientific* Precision Specific Gravity Hydrometers, 340mm Long</u> > Range: 0.880 to 0.950 (note Water = 1.000)

Hydrometer, Specific gravity; Fisherbrand; Precision; Universal range; Range: 0.880 to 0.950; Length: 340mm; With divisions of 0.0005; Use Cylinder 08-530K

<u>Item</u>	<u>Details</u>
Specific Gravity Range	0.880 to 0.950
Approx. Length	340mm

A hydrometer is an instrument used to measure the specific gravity (or relative density) of liquids; that is, the ratio of the density of the liquid to the density of water.
A hydrometer is usually made of glass and consists of a cylindrical stem and a bulb weighted with mercury or lead shot to make it float upright. The liquid to be tested is poured into a tall container, often a graduated cylinder, and the hydrometer is gently lowered into the liquid until it floats freely. The point at which the surface of the liquid touches the stem of the hydrometer is noted. Hydrometers usually contain a scale inside the stem, so that the specific gravity can be read directly. A variety of scales exist, and are used depending on the context.
Hydrometers may be calibrated for different uses, such as a lactometer for measuring the density (creaminess) of milk, a saccharometer for measuring the density of sugar in a liquid, or an alcoholometer for measuring higher levels of alcohol in spirits.

Other/Future Measurement

- Future home of other notes/guidelines